The Author to his Book.

AS in a glaſs herein you may behold
A goodly Caſcate ſet with pearls and
Not petty Gugau's to adorn the Breſt, (gol
The Neck, the Arm, but jewels of the beſt,
And choiceſt Learning, ſuch herein you'l find,
Will pleaſe your fancy and content your mind
Some for delight and recreation,
And ſome for ſerious contemplation;
Some in *Arithmetick*, that lofty Art,
Some likewiſe in *Geometry* are taught,
Some in *Aſtronomy* that Art moſt high,
Others teach how to decorate the *Skie*,
With ſplendent *Stars*, ſilver and golden *Shown*
Which are th' effects of *Philoſophick* powers;
Mind well therefore what's in this *Book*, and le
It hence be call'd *The Artiſt's Cabinet.*

The Author to his Book.

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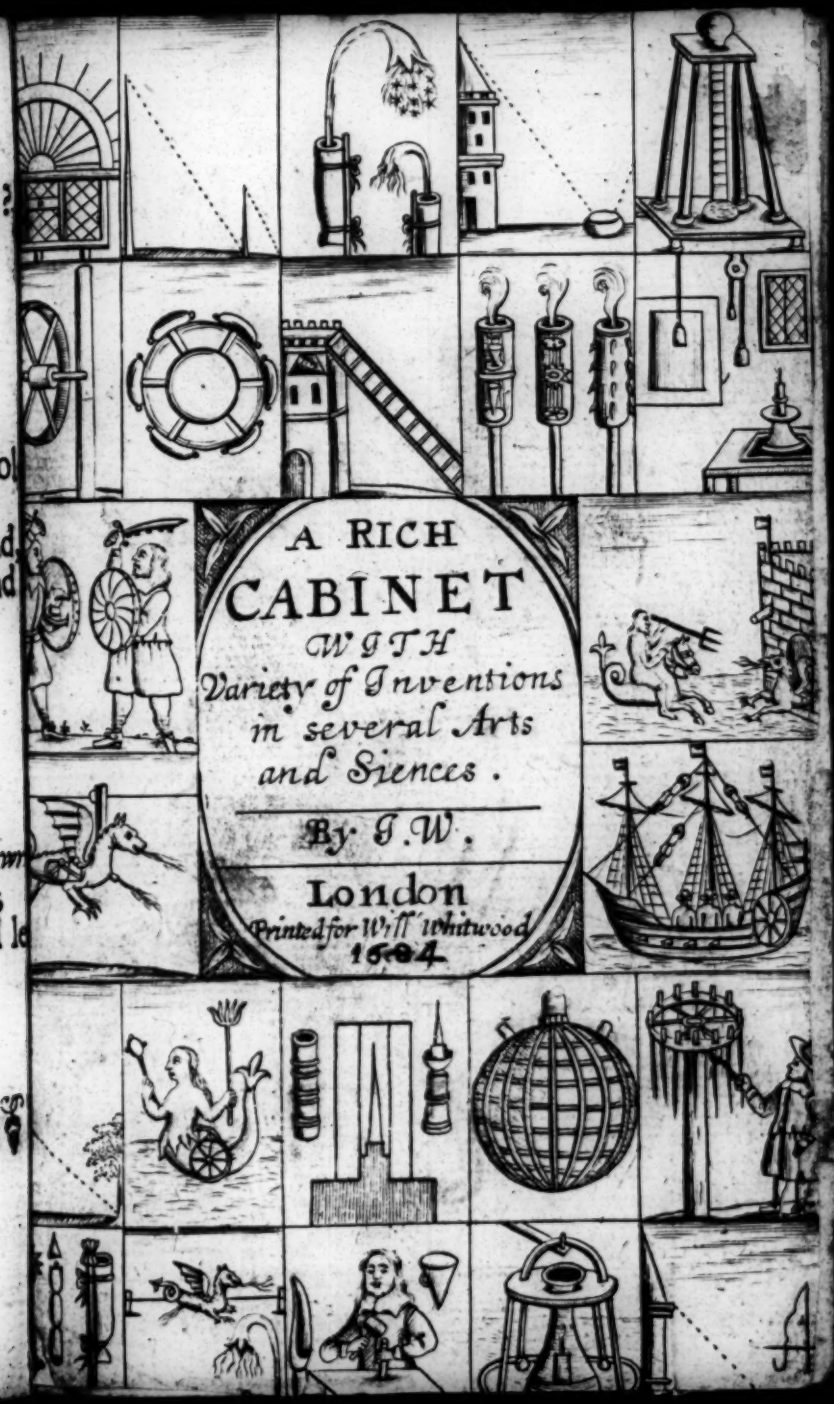
A RICH
CABINET
WITH
Variety of Inventions
in several Arts
and Sciences.
By I. W.
London
Printed for Will Whitwood
1684

A RICH CABINET, WITH Variety of Inventions,

Unlock'd and open'd, for the Recreation of Ingenious Spirits.

Being Receits and Conceits of ſeveral Natures, and fit for thoſe who are lovers of Natural and Artificial Concluſions.

AS ALSO

Variety of Recreative Fire-works both for *Land*, *Air*, and *Water*. And Fire-works of Service, for Sea and Shore.

Whereunto are added divers Experiments in *Drawing*, *Painting*, *Arithmetick*, *Geometry*, *Aſtronomy*, and other parts of the Mathematicks. Together with ſeveral Curious Receits of Great uſe, collected out of *Alexis*, *Mizaldus*, *Wecker*, &c.

By *John white* a lover of Artificial Concluſions.

The Fifth Edition, with many Additions.

LONDON,

Printed for *William Whitwood*, next the *Crown Tavern* in *Duck-Lane*. 1684.

A RICH

CABINET

WITH

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UNIVERSITY
LIBRARY:

TO ALL LOVERS of Ingenious and Artificial Concluſions.

COurteous Reader, (you know and I know, that) the Wits of this Age are acute and various, therefore how to pleaſe all mens fancies, is a Task too ponderous for my undertaking. I have here unlock'd and opened to your view a rich Cabinet of varieties; if there be any thing therein contained that may yield you profit, ſolace of the mind, recreation of the ſpirits, or content, I ſhall think my labour well beſtowed, and be glad; If it be otherwiſe, I ſhall be ſorry that I have nothing therein to pleaſe your mind, intreating you to ſhut down the lid again, and then I hope there is no hurt done.

This may be compared to a Garden compose
of sundry varieties, wherein you may pick an
cull out those Flowers that best please you, an
are fittest for your pleasure or profit; For t
laborious Bee gathereth her cordial Hone
and the venomous Spider her corroding poiso
(many times) from the same Flower. An
I know that there are some envious Critick
that will snarl at me for publishing many thing
contained herein; But I care the less, becaus
I aim at the publick (and not my own private
good; and no man (I think) should be born on
to himself, and hide his Talent: And there
fore these few Receits whith I have Collected
with divers of my own (gentle Reader)
dedicate freely to thy use; Knowing that A
imitating Nature, glories always in the va
riety of things which she produceth, to satisf
the minds of curious inquisitors of Nature
and Artificial Conclusions. Therefore I doub
not but there are many things contained in thi
small Volume, that will give satisfaction to th
Ingenious, for whose sakes I have compiled it
So taking leave, I will ever remain,

An Artists Friend,

JOHN WHITE

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To make a dainty walking-Staff to have Knobs where you please.
A secret way to write Love Letters, or other, that cannot be discovered.
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How to know the Moons age at her increase.
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How to refresh old Pictures, and make them look as if they were new.
To keep Swords, Knives, edge-tools from rusting.
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How to graver names, Posies, or Names upon an Egge.
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A pretty way how to cast flowers in wax of divers colours.
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How to in-lay colours in mettal, that will shew like Amel.
How to in-lay boxes, cabinets, or the like with hard wax.
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A rich Cabinet with variety of Inventions.

RECEIPT I.

How to make a glorious light with a Candle, like the Sun-ſhine.

THis is a rare Conceit, and fit for thoſe Artiſts, or others that perform curious and fine works by Candle-light, as Jewellers, Ingravers, or the like, or thoſe which are weak-ſighted to read by, never dazeling the eye.

Go to the Glaſs-houſe, or Glaſs-ſhop, and let them blow you a thin round Globe-glaſs, bigger then a penny Loof, (the bigger the better) with a ſhort neck like a Bottle, they know how to make them. When you have this Glaſs, with Glew or Wax bind a piece of Tape or Pack-threed about the neck or top, making a little loop therewith to hang by; then fill your Glaſs with the pureſt Conduit or ſpring-water you can get (putting ſome Aqua-vitæ therein to keep it from freezing) ſtopping it cloſe, to keep the duſt out; having thus done, if you will uſe it at a Table or Bench, take a Tenter-hook or Nail into the Seeling or Shelf, and with a Tape or Pack-threed faſten it to the loop, and hang it (but a round ſtick were better to hang it on, putting it into a poſt or hole in the wall, that you may let it higher or

lower at your pleasure in turning the stick: then behi your Glass set a Candle lighted upon the Table, and y shall have a glorious light through the Glass and water your purpose; behold the figure following.

Some use to place sheet of oiled paper b twixt them and a cand and this will cause a goo light.

RECEIPT II.

How (for a Wager) to cleave a thin Groat, or other pi of Silver in sunder, like two Groats.

THis to many will seem impossible, yet may thus done. Take three small pins, and prick them do upon a board, or table triangular-wise, and then take a t whole Groat, and lay it level on the heads of the th Pins, as you see in this same Figure; having thus done, tak

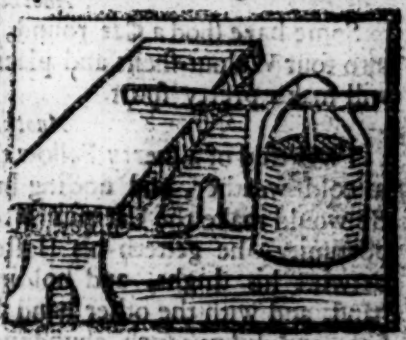
piece of Brimstone and bruise beat it to powder, covering Groat therewith all over, i pretty thickness, and then w a lighted piece of paper, or a dle, set the Brimstone on fire til it be consumed; when thi done, and the fire out, you s see the edges to open a little a dry Oister, then take a k and put into it, and it

easily cleave in sunder; having the impression on both sides very perfect.

RECEIPT III.

To lay one end of a staffe or stick upon a stool, or table, and to hang a Pail full of water at the other end having nothing to hold on the stick, nor nothing under the Pail.

TO perform this conceit, do thus, Lay one end of a Staffe or Stick a pretty way upon a table or Stool (so that it roule not off) letting the other end hang over the table likewise, (as you may see in this Figure here expressed) then take a Pail full of water, and hang the pail or handle upon the same; but you must have another short stick that will reach just from the inside of the bottom of the pail, to the long stick on the table, placing the short stick just under the pail very stiffe, and then shall the pail of water hang from the ground upon the long staves end on the table without falling, seeming very strange, but this is somewhat difficult at first, till you hit just in the center of gravity; yet I have often done it.



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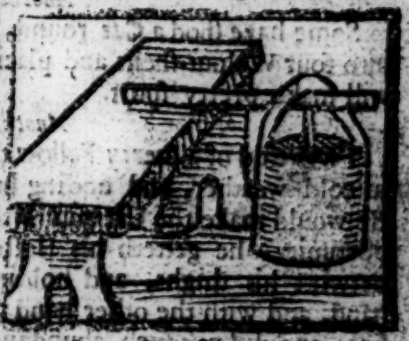


RECEIPT IV.

How to make dainty ſport with a Cat.

IF you will have ſome ſport with a Cat, then get a little Bell, ſuch as the tame Hawks have at their legs, and tye the Bell ſomething hard at the end of the Cats tayl and let her go, ſhe feeling of her tayl ſmart, and hearing of the Bell gingle, ſhe will run up and down as if ſhe were mad, flying againſt the walls and windows: then if ſhe can, ſhe will get into ſome hole to hide her ſelf, but when ſhe wags her tayle never ſo little, then out ſhe comes, and is as mad as before, and never will reſt in quiet till it be taken off, or ſhe can get it off her ſelf.

Another.

Some have ſhod a Cat round, with putting melted Pitch into four Walnut-ſhells, and placing her feet therein, and ſhe will make pretty ſport.

Another.

I was told of a merry Fellow that came into an Ale-houſe in cold weather, and finding but a reaſonable Fire, ſaid He would make the Cat piſs it out, and watching his opportunity, he getteth his Hoſteſſes Cat, putting her head betwixt his thighs, and holding her four feet faſt in one hand, and with the other hand held up her tayle near the fire, and did piſs ſuch abundance that ſhe quite quenched the ſame.

RECEIPT V.

How to make very pretty ſport with Ducks, or Poultry.

ONe Summers day my ſelf and two or three Friends walked into the Fields for our recreation, and being dry and hungry, we went to a Victualling-houſe in a Coun- Vil-

Village, where we could get nothing to eat but Bread and cheese, and sitting in an Arbour, the Womans Ducks being near us, we flung them our parings of cheese, the Ducks were very greedy of the same, (then quoth one of our Company) I will shew you some sport.

Presently he getteth about a yard of strong threed, and finding a little rag of red cloath, tyeth it to one end of the threed, and at the other end tyeth a piece of Cheese (somewhat lesser than a Bean) with part of the rind on: and throweth it amongst the parings to the Fowle, presently one of them swalloweth it down, now the rest of the threed and the Rag dragged behind her, and she wadling up and down, perceived the red Rag to follow her, of which she was sore afraid, then she did run from place to place, not knowing what to do, at length she took wing and flew into a Pond of water, and there she quackt, but presently she spy'd the Rag to swim after her, then down she dived, then up again, then down, then up, at length out of the Pond again in her former posture, at which the Woman was amazed and thought her Duck was bewitched. But at the length the threed was tangled at some bush or other, and so broke, or pulled the Cheese out of her belly, and then she was quiet.

The like sport you may have with other Poultry, by tying a long white Goose-quil, (or a light stick with a rag on the top) upright at her tayl.

RECEIPT VI.

How to know the hour of the day or night at any time, by a Ring and a Glass, being a dainty clock.

TAke a small Threed, and put it through a Gold Ring, or other like Ring, and doubling the Threed, tye a a pretty big knot at the end, and cut it off, and let the doubled Threed be seven or eight inches long, then take a Bole glass, and set it on a Table, and hold the knot of the threed something hard betwixt the ends of your forefinger

and your thumb, as you ſee here in the figure, which will cauſe the Pulſes of your wriſt to beat: let the ring hang in the middle of the glaſs a little within the rim, then the working of your Pulſe will make the Ring to move ſtriking upon the ſides of the Glaſs the hour of the day or night, and then the Ring will ſtand ſtill again.

RECEIPT VII.

Another excellent Rule, to know the hour of the Day or Night at any time.

IF any two (or more) Parties be in company together let one of them take ſomething from the ground, (what they pleaſe) and give it to another Party ſtanding by.

Now, if the thing taken up hath grown, and may grow again, as Seeds, Herbs, or the like, it is then 1. 4. 7. or 10 of the Clock, or very near.

If it did never grow, nor never ſhall, as Stones, Metal, Pot-ſheards, Glaſs or the like, it is then 2. 5. 8. or. 11. of the Clock, or very near.

But if it hath grown, and will never grow again, as Sticks, Chips, Shells, or ſuch like, it is then 3. 6. 9. or 12. of the clock, or very near.

But remember this Caution.

That both they that give the judgement, and they that take up the thing, do not know what hour it is before they try the Conceit.

RECEIPT VIII.

How to make two Knives (with a short stick) to hang upon the brim of a glass without falling.

TAke a little stick, some four inches long, and make it sharp at one end like a Butchers Scuer, and then get two Knives, somewhat of an equal poise, and prick the points of them towards the bigger end of the stick on each each side slope-wise, as you may see here in the Figure; then put the small end of the stick upon the rim of a Glass of wine or beer, and you may take up the Glass and drink, and they will not fall off.

RECEIPT IX.

How one may put his finger, or wash his hands in melted Lead without danger, or burning.

TAke an ounce of Quick-silver, two ounces of good Bole-armoniack, half an once of Camphire, and two ounces Aqua vitæ, then mingle them together, and put them into a brazen Morter, and beat them with a Pestle: having

thus done, anoint your hands all over throughly well w this oyntment, and then you may put your finger into m ted Lead, or you may wash your hands therewith, if pour the Lead upon them, and it will neither scald nor b you.

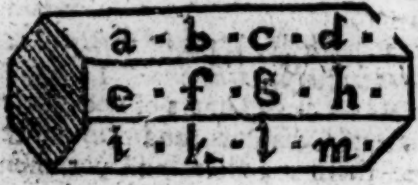
RECEIPT X.

A very pretty and ready way to teach Children or others, sudd to learn their A B C *in manner of Play.*

CAuse four pieces of Bone or Wood to be cut into square like Dice, and upon every side or square one of the letters of the Alphabet be ingraven or writ A.B.C.D.E.F. upon one of them, then G H I K L M the other, and so of the rest in order, as you may see in the Figure.

Now the Child tak delight, and using to with them (amongst ther Children) and ing told what Letters uppermost, will learn their Alphabet it were by the way sport and pastime.

Also, you may cause one piece of bone or wood t made into six long square sides, about an inch and a h length, and let each side be ingraven, or written with Letters, as a.b.c.d. and so of the rest of the sides, and let throw it, and name those Letters which are upperm and when they learned the great L you may write the Letters on, as it is on the Figure.



RECEIPT XI.

An excellent way to teach one to read ſpeedily and truly, that before could not diſtinguiſh their Syllables.

LEt a Scholar or one that can read well, take any Book of ſmall value, and at every Syllables end underneath or at the top, with a ſmall Pen of Ink, let them make a little ſpeck or mark: but if the ſpeck or mark were made with red Ink, it were the better; Or if it be in a Book that you would not deface, then take a ſmall Pin, or Needle, and prick little holes at each Syllable, which will hardly be perceived. This experiment is beſt to be made with hard words of many Syllables, as in the example following.

Abraham, Achitophel, Bartholomew,

Chriſtopher, Demetrius Anabaptiſt,

Mathematician, Nebuchadnezar, Quotidian, Patrimony, &c.

Theſe to the ingenious will ſuffice, for I have known thoſe which by no means could be brought to read, yet in a ſhort time by this method they have learned to read perfectly.

RECEIPT XII.

Of divers rare and dainty conceited motions, performed by the operation of the Magnet, *or* Load-ſtone.

MAny and wonderful Mathematical concluſions are performed by the *Magnet*, or *Load-ſtone*, only I will give a touch at ſome few for recreation.

Theſe ſtones are to be had at the Iron-mongers, but they ought to be poliſhed and made fit by a cunning Artiſt. This ſtone hath his two Poles, one North, the other South, anſwerable

ſwerable to the Poles of the world. For if you take a piece of Wyre of 4 or 5 Inches long, and touch one end there with a *Load-ſtone*, and then thruſt it through a piece of Cork, putting it to ſwim in a Baſon of water, preſently you ſhall ſee one end of the Wyre will turn full North, and the other full South.

This receipt is profitable for ſome Travellers, who having a Sewing-needle about them that is touched with the ſtone, may prick it into ſome little light piece of wood or Cork and place it in the water, and it will ſet out the North and South inſtead of a Compaſs.

If for recreation you take two Wyres, and put each Wyre into a Cork, touch one Wyres end with the North end of the ſtone, and the other Wyres with the South end of the ſtone, and then put them both into a Baſon of water a pretty way aſunder, yet they will begin to move and ſtir, and draw nearer together, and on the ſuddén joyn and meet: Now if upon thoſe Wyres or Corks there were placed little paper Tilters on Horſe-back, they would run their courſe at one another in the water very prettily.

Alſo, if this ſtone or *Magnet*, be incloſed in a box of Wood, Stone, Silver, or Braſs, yet it will extend its operation and working by many pretty and ingenious practices admirable to behold.

As for Example, if you will make the forms and pourtraitures of divers things in thin Paſt-board, as Horſe-men, Foot-men Ships, Boats, Beaſts, Birds, Flyes, Worms, Serpents, or the like, you may cloſely convey into them a ſhort piece of Wyre, and ſet them upon a Board, Trencher, or Paſt-board, and if you will have them move or walk, then hold the *Load-ſtone* cloſe in your hand, under the Board, and that way which you move your hand underneath, that way the images will move and creep on the top.

Alſo, if you place the *Load-ſtone* privately to, or near the Seeling, or over a Door, and then hold a piece of Iron near to it (tying a threed to the Iron) that it touch not the ſtone, which will attract it, and then the Iron will ſeem to hang in the Aire. If you touch an Iron *Ring* with this ſtone, it will take up a dozen or more rings together, hanging

nging one to the other like a chain. Alſo, if a knives ſhall be touched therewith, it will take up Needles or Wyre, and by it you may know the counterfeit, or New-ſe half-penny, as ſome call them.

Many other rare concluſions may be performed by this ſtone, which I forbear to write of. Fire, Garlick, or Onions, ſpoileth the virtue of this ſtone; therefore let it not touch or come near them.

RECEIPT XIII.

A pretty way to catch Kites, Ravens, Crowes, Magpies, or the like, alive.

GOe to the Apothecaries, and beſtow two pence in *Nux vomica*, then beat it to powder, or ſlice it as you do Ginger; this being done, take raw Fleſh or Liver, and cut it into little pieces or gobbets, that the Fowl may ſwallow them whole, then cut holes in the ſame, and put your powder or ſlices therein, and then lay theſe pieces where they haunt, but as ſoon as they have ſwallowed down the ſame, they will flye to the next high Tree they can come at, and this preſently makes them ſo drunk, or ſick, that they ſtraight will fall down from the top of the tree to the ground, that you may take them up alive with your hand: but you muſt be ſure to watch them and run preſently to the tree, for they will ſoon recover and and flye away.

I believe if it were ſodden with other Grain, it would have the like operation with other Fowl.

RECEIPT XIV.

A ready way to catch Pidegons, or other Fowl.

TAke pieces of brown Paper, and roul them round, making Coffins of them, ſuch as the Grocers make to put their ſuit in; let them not be above a finger long, paſte the ſides,

and

and ends of them with ſome ſtarch, clip the upper p
of them round with a pair of Sheers, then anoint the in
of the uppermoſt skirts of them round about with Birdli
or ſome ſtuff that will but cling to the Feathers: But
muſt (a day or two before you uſe it,) lay or ſtrew ſo
Peaſe or other Grain to make them haunt the place,
they will be the leſs fearful; then if you pleaſe, mak
hole in the ground a little way, and put your Coffins upr
or ſloping therein a few Peaſon or Corn in them, ſtrew
here and there Peaſon near them, and when ſhe pick
into the coffin, ſhe is immediately hooked, and blindfold
not ſeeing which way to flye; and thus you may take th
eaſily.

RECEIPT XV.

*A merry Receipt, being a ready and ſure way how to cat
Pick-pocket.*

AS I was writing the former Receipt, it put me in m
of a pretty conceit that a Friend once related to
which was thus: A Gentleman being in a throng in a F
had his Purſe pickt out of his pocket, he miſſing it, was ſo
what vext, but could not mend it, but ſtudied how (i
could) to be revenged: preſently he buyeth two pen
worth of Fiſh-hooks, and cauſeth a Taylor to ſew them ro
about toward the upper part of his pockets, with
points of them down-wards, and ſo the next day away
goes to the Fair again amongſt the throng, throwing
Cloak on one ſhoulder, ſeeming careleſs of his pock
wherein he had ſtore of money: Preſently there wa
Diver nibling at the bait, and nimbly had his hand in
pocket: The Gentleman being wary (perceived that
Fiſh had ſwallowed the hook) gives a jerk aſide wh
cauſed the hooks to catch good hold in his hand, and t
he had him ſure: Then ſaid the Gentleman, Fellow w
makeſt thy hand in my pocket? O good Sir, (replied
pick-pocket) pardon me, I cannot pull it out. C
(ſi

with the Gentleman ſoftly to him, becauſe no body ſhould ke notice) go along with me: So cheek by joll they alked together, with his hand faſt in the pocket (but vered with his Cloak) and to the Tavern lovingly they together, where the Gentleman told him of the loſs he d ſuſtained the day before, and making of him to reſtore ck his money, he cut out his pocket, and let him go. rely this pick-pocket had good ſtore of picking wor kto t the hooks out of his hands again.

RECEIPT XVI.

How to make Fowls and other ſmall Birds drunk, that you may take them with your hands.

YOu muſt obſerve what meat they love or uſe to eat, as Wheat, Barley, or other Grain, and lay the ſame to ep in the Lees of Wine, or in *Aqua vitæ*, or in the juyce Hemlock, and ſtrew the ſame Grain in the places where e Birds do haunt.

Another.

Take Tormentil and boyl it with ſtrong Wine, Wheat, rly, or other Grain, then ſtrew this in thoſe places where ou intend to take them, or where they uſe to haunt, and e Birds will eat the pieces among the grain, which will ake them ſo drunk that they cannot flye away.

Another.

Make Paſt with Barley meal, Onion blades, and Henbane eds, and put or throw it where the Birds do haunt.

Theſe experiments are beſt to be done in Winter in a ep Snow.

RE-

RECEIPT XVII.

A dainty way to catch Fish in a dark night, with a dle under Water.

GEt an Urinal, and put pretty ſoft clay therein, and ſomething that is flat at the end preſs the clay to the bottom of the glaſs, ſmoothing it as well as you then take a ſtick and ſhape it about the bigneſs of a Ca end, wet the ſtick, and put it into the neck of the making a hole in the middle of the clay, as you make candle-ſticks; then make a little hoop of a Willow and tye pieces of cork in four places of the hoop e diſtant, and get a thin light round piece of board, and four little ſticks of an equal length, tye one end of the the Corks, and the other ends faſten to the board to ſup it, as you may ſee here in this Figure.

In the board you make a hole in the dle to put the n the Glaſs through, there tye it and m loope with a ſtri the board that you with a long pole p into the water: you will uſe it, put Candle into the gl the clay ſocket, a below the brim, tha wind blow not the out. If you pleaſe may with Wax on put little pieces of ing glaſſes, or Glaſs under the on the ſide next the water, and this light will ſhine a compaſs in the water, and the Fiſh will ſtreight

to the same, where you may very easily take them with a net.

This might be done with the Glass alone, by tying Corks about the neck of the Glass, to keep the mouth above water.

RECEIPT XVIII.

An excellent Bait to catch Fish with an Angle.

MAke Paste with fine Wheat-flower, tempered with a little Saffron and Sugar, and bait your hook therewith, and they will bite apace. This is a good bait for Roch, Dace, and such like.

Another.

Take the crum of a new penny White-loaf and an ounce of *Cocculus India*, and an ounce of Henbane seed finely powdered, temper the same well with good *Aqua-vitæ* into Paste, and divide them into small pieces bigger than grains of wheat, and then cast handfulls in at once into the water where is store of Fish, and you shall presently see the operation of the same.

RECEIPT XIX.

How to make one Watching Candle, that it shall out-last three Watching Candles.

TAke a Pail, or Bucket, and fill it full of water, and set it in the place where you intend that your light shall stand; then take your Candle and warm it at the lower end, and there stick a brass farthing token, or such like; then you will light your Candle, put it gently down to the middle of the water, (but be sure that the bottom of the Candle do not touch the bottom of the Pail) and

and then it will ſwim upright to the very edge near t
light. The reaſon that the Candle will laſt ſo long is cau
by the coldneſs of the water; and this is a ſafe way th
no Rat can run away with the Candle lighted, as I ha
heard that they have done; by endangering the houſe w
fire.

RECEIPT XX.

How to write any name or mark upon a Paper, and then burn to aſhes, yet afterward it may be read plainly.

TAke a new clean Pen that was never written withal, a
dip in your own water as you do in Ink; then ſtr
up your Shirt-ſleeve above your wriſt and upon your ar
write your name, or any name or any mark, and th
let it dry on your skin, and nothing will be ſeen, then p
down your ſleeve and button your wriſt. (Do this pr
vately, and it will cauſe ſome to wonder:) then take a pie
of white paper, and write your name or the mark ther
on, with another Pen of black Ink, (but let it be writt
as like the other as you can) then take the paper a
burn it, and lay the aſhes on a Table, and ſtripping up yo
ſleeve, rub the aſhes hard with your finger, where you h
written with your water, then blow of the aſhes, and t
name or mark will plainly be read on your arm in black le
ters.

RECEIPT XXI.

How to view the back-part of your head by Glaſſes.

IF you would behold the back part or ſhadow of yo
Head (for a wound, or the like) take a Looking-glaſs, a
hold it behind your head, and then take another Lookin
glaſs and hold it before you, and from the Glaſs behind, y
may ſee your ſhadow in the Glaſs before you.

R

RECEIPT XXII.

A pretty trick to tell, or name all ſpots or court Cards in the Pack, and yet never ſee them.

YOu muſt privately drop a drop of water or drink (about the bigneſs of two-pence) on a table before you where you ſit, and ſet any body ſhuffle the Pack of Cards, and then taking them into your hand place a candle on the table before you (for this trick is beſt to be done by candle-light) and, holding down your head (as you may ſee in the Figure) lift the Cards above the brim of your Hat, cloſe to your head, that the light of the Candle may ſhine on the Cards, then in the drop of water (like a Looking-glaſs) you ſhall ſee every ſpeck of each Card before you draw them, which you may name; or putting your finger upon the ſpots, you may ſay that you feel them out; then lay down your firſt Card, and name the next, as your firſt Card was the Deuce of Clubs, the next is the five of Spades, and ſo of the reſt.

RE.

RECEIPT XXIII.

How to keep or preserve any Fowl, Venison, or other pieces of Flesh, sound and sweet for three weeks, or a month together, although the weather be never so hot.

MAke a strong Brine with Bay Salt and white mingled together, so as the water be over glutted with Salt and being scalding hot, parboyl therein the Fowl, or Flesh which you intend to keep for some reasonable time, (that is to say, according to the greatness and greasiness thereof) then hang it up in a convenient cool place, and it will last a sufficient time, without any bad or over-saltish taste.

This is a good way for Sea-men, and others in hot countries, who are inforced sometimes to victual themselves in such intemperate climates where no flesh will last sweet four and twenty hours together, by reason that they have no means to make the same to take Salt, which without question will enter this way and make penetration very speedily, by reason of the hot and fiery spirit of Salt thus prepared.

RECEIPT XXIV.

How to make a speedy or present Drink that Travellers may brew for themselves, when they cannot relish their Beer or Ale at their Inns.

TAke a quart of good water, put therein five or six spoonfuls of good *Aqua-vitæ*, and an ounce of Sugar, with a branch of Rosemary, brew them a pretty while out of one pot into another, and then is your drink prepared.

RECEIPT XXV.

w to make on the ſuddain, good drink for Mariners, Soul-diers, or for poor people, when Beer is ſcant, and Malt dear.

ſ time of extremity, theſe things following will ſerve to ſuffice nature (as hath been often proved;) put a good ntity of wholſom fair water, a ſmall portion or few ops of the Oyl of Sulphur, incorporating them well to-her, and it is ready.

Another.

One drop or two of the Oyl of Vitriol added to a good ntity of fair water, and well ſtirred together, perform-the like.

ome mingle Vinegar with good water, and it ſerveth ve-well to quench the thirſt.

Others will carry a piece of Allom in their pocket if they to travel, and know not how to get drink or water, and n they are a dry, they put a piece of that in their uth, and it will fetch up moiſture which will aſſwage the rſt.

RECEIPT XXVI.

ofitable way to harden Leather, that it ſhall out laſt o-ther Leather a long time.

his is a good and profitable Receipt for many poor la-bouring men, and is thus performed; Take and lay ſuch her as is well tanned to ſoak in water, wherein there been ſome ſtore of filings of Iron, a long time, or elſe he water that hath long lain under a Grinding-ſtone, into ch ſuch Iron as hath been from time to time ground a-hath there ſetled.

his is good alſo to harden Leather for the Cawkers or s of Ships, or others, to make them laſt long.

RECEIPT XXVII.

An excellent Receipt to make a dainty ſtreight walking-ſt have knot's where you pleaſe.

GEt a ſtreight piece of wood (of your deſired leng of Holly, Aſh, Service-tree, Walnut-tree or Pear-t let it be free from knots, or ſhakes, then plain it into ſi eight ſides, a good deal bigger than your Staff ſhall be; being done, get a ſhort Punch of Iron, and let the f end be filed about the bigneſs that you intend your k ſhall be filed about a bench or table, and where you make the knobs with a hammer punch holes therein, a do on every ſide, then plain it over again till you have r your ſtaff ſmooth, that there be no dents ſeen there when you have thus done, put it into ſome cauldron of ing water for a good ſpace, and when you take it o gain, you ſhall ſee that it will be full of knobs, for with heat of the water it forceth the bruiſes (which were m with the Punch) to ſwell out of the wood again.

You may file your Punch like a Star, or other work it will ſhew very pretty; I once ſaw a Partizan, or tains Leading-ſtaff, which was done in this manner, being put into a Dyers Cauldron when he dyed bl when it was dryed, and rubbed well with Linſeed o ſhewed like Ebony.

RECEIPT XXVIII.

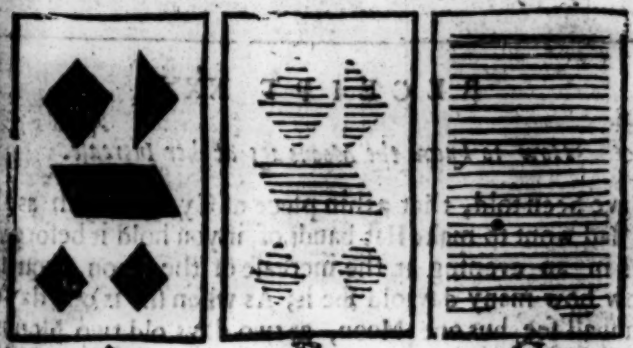
How to write a Love-letter ſecretly, or from one Fri another, that cannot be diſcovered.

TAke a ſheet of white Paper, and double it in the m then cut holes through both the half-ſheets, l holes be cut like the panes of Glaſs-windows, or other what you beſt fancy, and then with a pin prick tw

holes at each end, and cut your paper in two halfs, give one half to your Friend (to whom you intend to write) the other half keep to your self: Now when you do write, lay your cut paper on a half-sheet of writing paper, and stick two pins through the two holes that it stir not; then through those holes that you did cut, write your mind to your Friend; when you have done, take off your paper with the holes again, and then write some other idle words both before and after your lines, but if they were written to make some little sense, it would carry the less suspicion; then seal it up and send it.

When your Friend hath received it, he must lay his cut paper on the same, putting pins into the pin holes, and then he can read nothing but your mind which you writ, for all the rest of the lines are covered; observe the Figure, and it is easily apprehended.

Where the Letter A is placed, that doth signifie the half-sheet of cut paper with holes; where the Letter B is placed, doth signifie the substance of the Letter which you write, and where the Letter C is, doth signifie the Letter filled up with lines to joyn to the other words. Now when your Friend writes to you, he must do the like.



Another.

Write a Letter (what you pleaſe) on one ſide of pa with common Ink, then turn your paper, and write the other ſide with milk, (that which you wo have ſecret) and let it dry; (but this muſt be writen w a clean pen:) Now when you would read it, hold that ſi which is written with Ink to the fire, and the milky Let will then ſhow blewiſh on the other ſide, which may perfectly diſcerned.

RECEIPT XXIX.

How to know when the Moon is juſt at the full, by a Glaſs of water.

TAke an ordinary Drinking-glaſs, and fill it full of wa up to the very brim, ſo that it doth not run over, let be done a little before that the Moon be at full, and the the very inſtant that the Moon is at the full, the water preſently boyl over.

RECEIPT XXX.

How to know the Moons age at her Increaſe.

I Have been told, that a thin piece of Cypreſs, ſuch as had wont to make Hat-bands of, if you hold it before eyes in an evening at the increaſe of the Moon, you know how many daysold ſhe is; As when ſhe is one day you ſhall ſee but one Moon, at two days old two Moons three days old three Moons; but afterward you ſhall but one again.

RECEIPT XXXI.

A dainty way how to fetch Oyl, or Greaſe, out of Books, Writings, Papers, or Garments.

GO to the Apothecaries or Grocers, and buy a penniworth or two of the Oyl of Turpentine, and put a drop or two upon the place which is Oyly or Greaſie, rubbing it on, and then you ſhall ſee how it will drink up the Oyl or Greaſe, and be preſently dry and fair; for this Oyl of Turpentine is a great dryer, and is good to put amongſt Oyl colours, to make them dry ſpeedily.

RECEIPT XXXII.

How to refreſh and ſcoure old pictures, that are wrought in Oyl, making them to look almoſt as freſh as if they were now done.

TAke the Picture out of the frame, then wipe, or bruſh off the duſt very clean, and then lay it level upon a board, table, pouring good ſharp Vinegar all over the ſame, and there let it lye and ſoke for three or four hours; if the Vinegar be dryed up, then pour on more, continually keeping it wet: then beat a piece of dry brick very fine to powder, (and ſee there be no lumps or ſtones therein, for they will raze and ſcratch the Picture) and then put the powder into a courſe linnen rag, and tye it, and then dip it in a Porrenger of Vinegar, and with your rag and powder, rub and ſcour your Picture all over very hard, and then with fair water or a wet clout, waſh the filth away: if you ſee any ſpots or filth remain, then ſcour it again and waſh it; then dry it very well with a cloth, and when you have dryed it, put it again into the frame, and ſet it in the Sun for a day or two, (for the Sun refreſheth the Colours very much) and then rub it hard with a dry woollen

len cloath till you make it ſhine, and then hang it This will cauſe it to look almoſt as freſh as when it new.

Some uſe to waſh them in Soap, and then Oyl or Var them over, but that is not good, becauſe that the Oy Varniſh will turn yellow, and gather duſt.

RECEIPT XXXIII.

How to keep Sword-blades, Halberts, Piſtols, Knives, E tools, or other things from ruſting for ſeven years, or more, in a dry houſe.

TAke Fiſh Glew, or Iſing-glaſs, and cut it in pieces, with a Hammer beat or bruiſe it upon an Anvil ſtone, and then put it into a little skillet, or ſuch like, water, and let it diſſolve over a gentle Fire, ſtill ſtirri as you do your common Glew; thou when it is well bo take it off, and with a *Pencil*, or ſmall hair-bruſh, lay the while it is hot, all over your Sword-blade as thin as ma and then lay it to dry, and it is done. This thin coat eth the moiſtneſs of the Air from the Mettle, that it ca ruſt; but when you are to wear it or uſe it, take knife, and you may eaſily ſcale off the thin ſubſtance, then it will be as bright as any ſilver.

I verily believe, that our common Glew will do the keeping of it in a dry room.

RECEIPT XXXIV.

An excellent Cement for broken Glaſſes, China-diſhes, and ſuch like.

TAke one part of Virgin-wax, and two parts of the or clear drops of Maſtick, melt them together and ment therewith. But the better is, if you beat the Fiſh-glew or Iſing-glaſs with a hammer till it begin

clear, and then cut the ſame into very ſmall and ſhort pieces, and diſſolve and melt the ſame over a gentle Fire with *Aqua-vitæ*; then let one that ſtandeth by, hold both the pieces that are to be cemented over a chafing-diſh of coals till they be warm, and during their heat, lay on the diſſolved Glew with a fine Pencil, then bind the Glaſs with Wyre, or Pack thread, to keep it ſteady, and ſo let it remain till it be cold and dry.

Another.

Take a little quantity of unſlaked Lime, wheat-flower and the white of an Egg, and incorporate them together. Maſtick, *Aqua-vitæ*, and white lead is good; ſo is Iſing-glaſs, being diſſolved and melted with Rheniſh-wine.

RECEIPT XXXV.

How to grave Arms, Poſies, or other devices upon Eggs, which may be ſerved at a table.

MElt Suet pretty warm, and dip in your Eggs in this manner, hold the Egg between your thumb and your fore finger, and quickly dip one half therein, and hold it in your hand till it be cold, and then dip in the other end that it be thinly covered all over, then take a little Bodkin or Needle, and grave in the Suet what Letters or Words you pleaſe, then lay the Egg thus ingraven in good wine-vinegar, or other vinegar in ſome ſtone Pot or Veſſel for the ſpace of ſix or eight hours more, or leſs, according to the ſtrength or ſharpneſs of the ſame, then take out the Eggs, and in hot water diſſolve the Suet from the Shells, then lay the Egg to cool, and the work will appear to be graven in the ſhell of Ruſſet colour. And if the Egg lye long enough in the Vinegar after it is ſo graven, the Letters or Works will appear upon the Egg it ſelf being boyled, and ſo you may ſerve them up at the Table. And if you care not to loſe the meat, you may pick out the ſame, when the

the ſhell is through graven, and you ſhall have a fine piece of work performed on the ſame.

RECEIPT XXXVI.

How to make wax either red or green.

TAke to one pound of Wax in Summer, three ounces of the cleareſt Turpentine; but if you make it in Winter, take four ounces of Turpentine, melt theſe together over a ſoft fire, ſtirring them with a ſtick, and when they are well melted together, take it off, and let it cool a little, and then mix with the ſame the red root of *Anchuſa*, or Vermillion ground an ounce, and an ounce of ſweet Oyl; ſtir theſe well together again over the fire, then take it off to cool, and pour it into cold water, and then upon a wet board, and your hands wet, you may roul it into what form you pleaſe. Inſtead of Vermillion, you may take three times as much Red-lead, but that is not ſo good.

If you will make Green wax, inſtead of Vermillion take the like quantity of Verdigreaſe.

RECEIPT XXXVII.

A pretty way how to caſt off Flowers in wax, of divers colours.

CAuſe a Stick to be turned round at one end, (ſomewhat Taperwiſe) like the faſhion of a Poking ſtick, leſſer, or bigger, (according to the bigneſs of the Flowers you intend to caſt) and at the ſmaller end thereof, with your knife, cut rents or nicks in the ſame, long-wiſe as you

see here in this Figure: The letter A. signifieth the Stick, the letter B. signifieth the Flower: Then take a little panikin, and in the same melt your Wax with a gentle fire, and when it is melted take it off, and then take your Stick (having a Porrenger of fair water by you) and dip the end into the water, and then shake off the water, or suck it off, and then dip the stick into the Wax, and suddainly pull it out again, dipping it into the water again to cool it, and then you may take off your flower and lay it by: and in this sort you make as many as you please: for yellow Flowers, melt yellow Wax; for Red, red wax; for white, white wax; for green, green wax. Now for stalks for your Flowers you may stick in a small wyre, or a Bent of a raison-frail, or the like. You may have the coloured wax ready made at any of the Wax-chandlers.

RECEIPT XXXVIII.

How to make a Bunch of Grapes with Green Wax, that will seem to be naturall,

YOu must get a little stick turned round at the end, about the bigness of an Arrow; and then have your vessel of green wax melted, (as was shewn in the former receipt,) dipping your stick in the same about the third part of an inch deep, and it will be almost in the fashion of an Acorn cup, make a good many of them. Then take an Egg, and make a little hole in the bigger end of the shell, less than a penny, and get out the yolk thereof and dry the shell;

ſhell; then with a piece of your green wax hold it to the fire, rub or daub the ſhell therewith thinly all over, then hold the ſhell in your left hand, and with your other hand take up firſt one cup, holding the ſame a little near a candle to warm, and quickly ſtick it on your egg, and ſo do with all the reſt of the cups, till you have filled it all over; they muſt be ſet ſomething cloſe together. Now when you have thus done, take a little ſtick, about the bigneſs of the tag of a point, and tye a pack-thread in the middle thereof, and then put the ſtick into the hole of the ſhell, and ſo hang it up: You may cut leaves like Vine leaves in green paper; and faſten them to the ſtring or ſtalk above the bunch: I have made ſome womens teeth to water at this conceit, they ſeem ſo natural to the eye; and theſe Grapes will laſt all the year.

RECEIPT XXXIX.

How to grave and in-lay Colours into Gold, Silver, Iron or Copper, to ſhew like Ammel.

FIrſt, cover your Mettal with a cruſt of warm Wax, and when it is cold, with a fine ſharp bodkin draw, or cut out the ſhape or proportion of what you pleaſe, either Letters, Flowers, Borders, or Scutcheons, of areaſonable largeneſs: then pour upon the ſame empty places (which you have ingraven upon the wax) ſome few drops of ſtrong water or *Aqua fortis*, and let them lye a while, and when you find them deep enough graven, mingle Orpiment and Maſtick melted together for a yellow colour, and Vermilion and Maſtick for red, and Bice and Maſtick for a blue, and Ceruſe for white and Ivory burnt for a black. Note when your Maſtick hath been melted with any of the ſaid colours, let it cool, and beat the ſame into powder, and lay the ſame powder within the graving, and after lay it mettle upon a ſmall Char-coal fire till the Maſtick be melted, and it will remain faſt and firm therein a long time.

RECEIPT XL.

How to In-lay Boxes, Cabinets, or other things with hard Wax.

WIth a Pen draw upon your Box any thing what beſt pleaſeth your fancy, as Birds, Beaſts, Flies, Flowers, Fruits, Leaves, Trayls, Anticks, Letters, *&c.* Then take a little knife ground ſharp at the point, and cut or grave out the work pretty deep which you have drawn with your Pen upon the wood; when you have ſo done, lay upon the ſame ſome red or green hard wax, and with a hot Iron melt and rub hard the wax all over into the crevices, or works which you have cut out, and ſo let it cool: then take a knife and ſcrape away the wax to the board, and then you ſhall have your work which you drew, to be in-laid very perfectly in the colour of your wax, as though it were drawn with a Pen, and will never waſh nor wear off, when you have ſcrap't it clean, hold it a little to the fire, and it will fetch a gloſs on the wax, and make it to ſhew the pleaſanter.

RECEIPT XLI.

How to harden the white of Eggs into an Artificial Gum fit for many uſes.

SEparate the Whites of Eggs clean from the yolks, and beat the Whites very well into a clear oyl, or water, and when it is ſettled, skim off the froth; then put the ſame into Bladders, and hang them in a chimney-corner, where fire is uſually kept to dry, and in a few days the ſame will become as hard as Gum Arabick: in hot weather you may hang your Bladders in the Sun to dry; This Gum may be uſed in ſtead of other Gums, and with is you may varniſh Prints, or other things that are waſhed in colours.

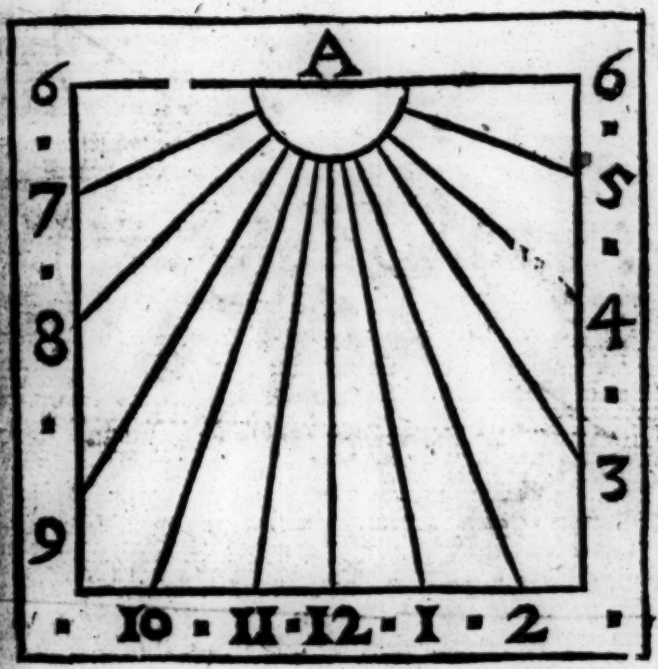
RECEIPT XLII.

How to make a true South Sun-dial, to be placed upright against a Wall or on a Pole.

I Intend not to ſpeak of the multiplicity of Geometrical and Artificial ſorts, and making of Sundials, (of which many ingenious Artiſts have copiouſly written) but a Mechanick way of two ſorts, for the benefit of ſome who would be glad to know how the hours of the day paſs away.

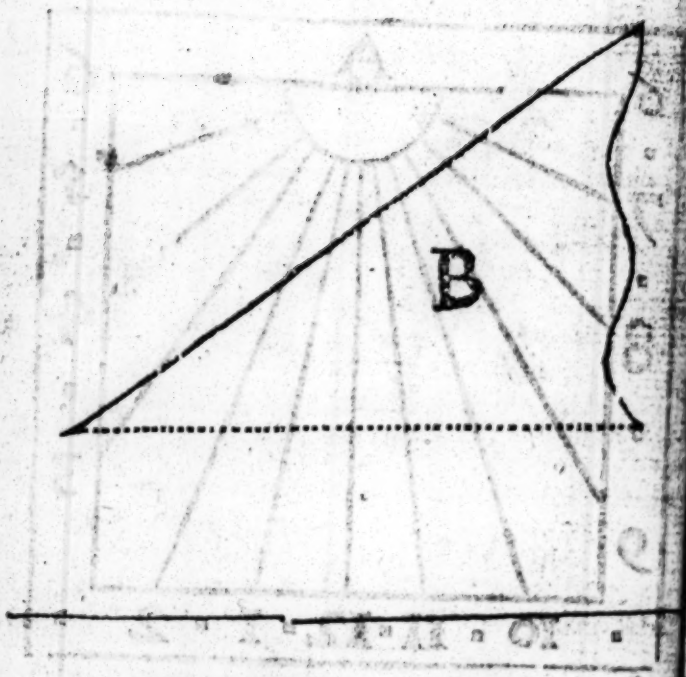
Take a piece of good writing paper, and rub it over with Linſeed-oyl, and hang it to dry in the Sun, when it is thorow dry, take and lay it over this print of the Dial (or ſome other of this nature) that you may ſee the hour lines through it, holding of it ſafe from ſtirring, (which may be done by pinning it to the margent,) then at the center by the letter A. ſtick a Needle or pin upright, and laying a ſtraight ruler cloſe to the pin draw all thoſe hour-lines which you ſee through the Oyled Paper; then take off the paper, and when you would mark out a Dial, do thus; get a board of what ſize you pleaſe that is ſmooth plained, and will not warp, drawing a ſtreight line juſt down the middle thereof, and lay this paper thereon, and then put your pin thorough the center hole toward the top of the ſtreight line on the board, and put another pin toward the bottom of the line, which is your 12 a clock line, (theſe two pins keep your paper ſteady,) then with a ſmall bodkin prick a hole through every hour-line of your paper into the board, and then take it off; then ſtick your pin into the center hole of the board again, and laying the ruler cloſe to the pin, and cloſe to each hole in the board, mark and draw your hour-lines; (and note that you may extend theſe hour-lines to what length you pleaſe, according to the bigneſs of the board;) and then figure it as you ſee in this example following.

Now



Now for the Cock or ſtile of your Dial, it muſt be ſet in the 12 hour line, and muſt be juſt equal in height from the board, as the triangular Figure marked with B. ſheweth; the line with pricks is but to direct you which ſide muſt be next to the board: The Stile may he made of a thin Iron plate, and cemented in, or of a ſtiff wire; the upper end of which muſt be put juſt to the center by A. equal to the 6 hour line: when this is done, you muſt get ſome Painter to paint it in Oyl-colours, and ſo ſet it up.

R E.



RECEIPT XLIII.

How to make a Horizontal or Flat Dial, ſtand upon a Poſt, or other place.

THis Dial may be made into ſundry forms, either ſquare, ſix, or eight ſquare, or round as you pleaſe, it is to be placed on the head of a Poſt; either in Yard, or at the out-ſide of a Glaſs-window where Sun cometh: behold the form.

You must note, that the hour-lines of this Dial do ... from the former, and so doth the Stile in height: ... you must work with this as in the other with your ... paper, to draw the hour-lines, and to make a line ... the middle for your 12 a clock line. The center ... Dial is hard by the letter C. and must be more ... the middle than the other, because it containeth ... hours thereon, for the other will serve but from ... but this from 4 to 8. You may make this Dial ..., Wood or Mettal, and remember to make the ... this Stile or Cock according to this triangle ... with the letter D. for it must be higher, as you

may perceive by t
Figure. You may m
Cement for to faſten
ſtile, with Rozen, p
der of brick and ſo
chalk, mingled togeth
and with a hot Iron m
it into the creviſe.

Note, That theſe Di
will not ſerve in any p
of England, *but within*
or 20 *miles of* London.

RECEIPT XLIV.

A pretty way to make a Sun-Dial on the Ceiling of a ro
or chamber, whereby you may know the time
of the day, as you lye in bed.

IF you have any window South-Eaſt, or South, whic
beſt, and that is for your turn, in the lower poſt or fra
of the inſide of your window, about the middle, fa
with wax a little round piece of Looking glaſs, or o
glaſs, about the bigneſs of a two-pence, (you
cut it round with an old pair of Scizzers;) but if
place it higher in your window on a ledge, it will be
better, (as you may ſee here in the Figure,) ſetting it
vel with the Horizon; and the reflection of the Sun in
Glaſs will ſhew on the Ceiling the hour of the day,
center of the Dial will be without the window and not
pendicular to the Glaſs. This Dial muſt have no Stile, a
muſt be made like the laſt Horizontal Dial: You may d
the circle, hour-lines, and figures with a penſil or coal,
black ſpot is the piece of Looking-glaſs, the Dial is the cie

RECEIPT XLV.

How to make a Candle-Dial, whereby you may know the hours of the night.

ONe Winters evening ſitting by the fire, me thought there might be ſome device for a Candle-Dial; At ch it came into my head, I made a little four ſquare e of wood, of a piece of a thin Trencher, making the ide thereof fit for the bottom of a Candle-ſtick to ſtand which I did ordinarily uſe; on two ſides of the ſquare I ced a little piece of Wyre, not a quarter of an inch , and juſt where the Candle-ſtick ſhould ſtand, on a e or Board, I made two little holes with a Bodkin for

the ends of the two Wyres to go into, and then I set my Candle and Candle-stick into the square: Havi done, I made a long Frame like the Frame of a Pictu pasted half a sheet of white paper therein upon a thin b and so hang'd it up against the wall; Then in the Ci

fasten'd a sma ley, and on th ley I had two plummets of one broader bottom than ther, and ty'd to a piece of thread at each and so hung in a Pulley, (may better a hend by the f the broadest met I pulled till it gave a sh on the lower e the paper in frame on the (which is no 1 and 7 a line, and whe broad bottom cast a shadow I made a speck with my and then turned an hour glass, and when that was ru I made another speck, which is the 2 and 8 line, an the rest: by these divisions, you may with a pair of passes divide the rest of the hour line upwards, you Pull down the broad Plummet and set it at any time to hour you please, as by this, it shews that it is half an past 4 or 10 of the clock. You must remember to your candles always of one size or weight, as of the e or twelves in the pound, or such as you usually burn may take away your Candle and candlestick out of square frame if you have occasion, and then set it do

place again, which keeps all right. I have placed the ures at each end of the hour-lines, as from 1 to 7 on the side, and then from 7 to 12 on the other-side. Note en it is just 7 on the first side, then pull down the Plum- to 7 on the other side, which I hold to be the best

RECEIPT XLVI.

to keep Cherries, Pears, Nuts, or other Fruit a year as fresh as they came from the Tree.

When they are pretty ripe, cut off the stalks, and put them into an earthen pot well loaded, and then them well with Honey, then stop the pot with Pitch, that no ayre may enter in, and then put the pot in Cellar, or cool place, burying it well in Sand; and so remain till you use it.

RECEIPT XLVII.

to make Grapes, and other Fruit to have no stone or kernels.

is said, that if you do plant or set the smaller end of the twig of a vine some-what deep into the earth (which take root) that those Grapes that will grow thereon have no stones: the like effect have peaches, Apricocks Plums, and other Stone-fruits, if the small end of the be grafted into the stocks. Also if you bend down the ends of an apple or pear-tree cyon, and graft on both sides of the stock; and the next year when have grown, cut the cyon in the middle, one shall bear with kernels, the other none.

RECEIPT XLVIII.

How to make yellow Roſes grow, and to make Trees and things grow green all the year.

I Have been informed, that if you graft a white Roſe on a Broom-ſtalk, or on a Furzen buſh, that the ſame bear yellow Roſes, but they will have no ſweet ſ

Alſo, if you will graft a Roſe, or other thing up Holly-ſtock, the leaves of the ſame will grow green all year.

RECEIPT XLIX.

How to make Apples, Pears, and other Fruit of ſeveral co and to give them a dainty taſt of Spices.

IF you will give a pleaſant colour to your Fruit, do For a red, boyl Braſil, Turn-ſoyl or Sanders, and a yellow, uſe Saffron, or Turmerick. Now to give a dainty taſte and ſmell, you muſt beat Cloves, M Cinamon, and Nutmegs, to powder, and mix with the water of your colours with ſome honey; with an auger bore a hole in the biggeſt part of the unto the middle, ſome-thing ſloaping down-wards, and pour your water and ſpices into the hole, then with made of the ſame Wood, or tree, beat it hard into the and ſaw off the end, and wax it about: This muſt be in Winter before the Spring, becauſe when the ſap r the colour, ſcent, and taſte alſo aſcendeth with the

RECEIPT L.

An excellent way for baking of Bread that it ſhall not b cruſted, nor yield ſo many crums.

GO to the Plate-worker, (ſuch as maketh ordinary ping-pans) and cauſe him to make a pot, or Po

is Latten-plate, which may contain half a peck, or greater, or leſs, as you pleaſe, according as you mean the bigneſs of your Loaf ſhall be; let this pot be made with a bottom at the lower end, and open at the top, almoſt like a beaker, as you may ſee here by this Figure, and when it is done, take a little butter, and anoint the in-ſide of the pot therewith, and when your Dow is moulded, put it into the ſame, (not full to the top) and thruſt it down hard to the bottom, and then ſet it into an oven amongſt other bread, with the leſſer end down-ward; and when it is baked, it will eaſily come out: this Loaf will have no hard cruſt, nor crum as other loaves do, and will ſhew ſmooth, ſtanding like a Sugar-loaf upon the table, and in a little compaſs.

RECEIPT LI.

A dainty, ſtrong, and gliſtering Mortar, or Plaſtering for Cielings, or for Walls.

It is ſaid that in *Italy* they much uſe this Conceit for Plaiſtering of their Cielings, Floors, or Walls, which is by mixing and well tempering together Oxen and Cowes dung with fine Loam or Clay, and it will be a very ſtrong and binding ſubſtance, and being well ſmoothed it will glaſter, and become very hard.

RECEIPT LII.

How to give eaſe, and help the raging pain of the teeth without drawing.

THis is alſo performed with the ſpirit of Wine, or *Aqua-vitæ* (as you have read in the former Rece by pouring it into the ears, eſpecially on that ſide your pain lieth: but after that you have let the wate forth of your ears, then with more of the ſame (againſt the fire) you muſt rub and chaſe your ch and under your jaws, and behind your ears, ſtroaki them upwards with your hands toward the neck, to back the humours: for it is nothing elſe but a cold r that diſtilleth from the head into the gums which ca the pain: therefore be ſure to keep the head very w when you have done.

I have been certified (but how true it is I know n that three teeth taken out of a dead mans skull, and ſo in a clout, or piece of leather, and worn about t which were much ſubject to the Tooth-ach, gave t preſent eaſe, and they never were troubled with the ſo long as they had thoſe about them.

RECEIPT LIII.

A dainty Receipt for curious Artiſts, or others, t ſtrengthen, and comfort the eyes.

THis Receipt I had of a curious Ingraver, and my Fr who every morning before he went to work, h corner of his Hand-kerchief, (or a clean linnen rag) put a few drops of Aqua-vitæ, and with the ſame wipe the corners of his eyes, eyebrowes, and tem which did keep back the Rheum, and greatly did ſtreng and comfort the eyes; of which I have often made u and found much comfort.

RECEIPT LIV.

A precious Salve for all those that have had any member out of joynt, called Jeremy of Brunswicks Salve.

THis famous Chirurgeon, with this Salve, hath healed those that had formerly their members out of joynt, or those that had been wounded and could not stir or bow the member where they had the hurt; for by this Salve did he bring many stiffe and crooked joynts again to their former strength, to the great admiration of all men, both Chirurgeons and others.

How to make the Salve.

Take two ounces of old Hogs-grease, and of Ducks-grease, and Goose grease, Hens or Capons-grease, of each two ounces; Linseed-meal, Fenugreekmeal, of each two ounces, Oyl-olive eight ounces; Opopanax, Mastick, and Frankincense, of each an ounce: dissolve the Gums in white wine that are to be dissolved, and powder the other, mingle them altogether, and add wax and turpentine to them, then boyl them all together with good stirring.

RECEIPT LV.

An excellent unguent, or Liniment for green Wounds, especially for those in the head.

TAke of the best Turpentine an ounce and a half, and as much of Gum Elemi, of Capons-grease an ounce, melt these at the fire, and mingle them. When you use it, melt it, and anoynt the edges of the wound, and dip a pledge of lint in it, and then lay a plaister on the top of the same, and roll it gently.

RE-

RECEIPT LVI.

How to make a ſoveraign Oyl, or balm for all wounds ſimple confuſed.

TAke three pound of common Oyl, two pound of Turpentine, wheat that is cleanſed five ounces, Saint Johnwort a pound, Valerian, Carduus Benedictus, of each fourteen ounces; bruiſe the Herbs, and infuſe them in white wine ſix or eight hours, then put thereto the Wheat and Oyl, and boyl them on an eaſie fire, till the wine be conſumed: then ſtrain them, and put the Turpentine in, and then boyl them again on a ſoft fire to perfection.

RECEIPT LVII.

An excellent Emplaiſter, which is good for all wounds or ulcers.

TAke Deers ſuet four ounces, Roſin, and Perroſin, of each a pound and a half, white wax, and Frankincenſe, of each four ounces, Maſtick an ounce; melt the wax and ſuet, and powder the gums, and put them together, and when they be melted, ſtrain them through a piece of Canvaſe, then add to them a pottle of white-wine, and boyl them all to the compoſition of the wine, with continual ſtirring, and then take it from the fire, and when it is almoſt cold, put thereto four ounces of turpentine waſhed in white wine, and of camphire powderd two ounces; then make roules of it, and keep it for your uſe.

RECEIPT LVIII.

Another excellent Plaiſter for Wounds in the Breaſts, or other parts.

TAke Roſin that is freſh, clear and ſweet, a pound, Oyl of Bayes, and turpentine, of each two ounces; Gum Elemi

Ilemi ſweet and good four ounces; melt the Roſin and Gum together, and ſtir them well; then put in the Oyl and turpentine, and let it boyl, with continual ſtirring, and then ſtrain it, and reſerve it for your uſe in a cloſe pot.

When you uſe it ſpread it on a piece of leather, bigger than the wound by three fingers breadth, and make a hole in the middle of the leather for the corruption to run forth, this doth it without tent or pledget, dreſs it twice a day in the Summer, and once a day in the winter.

This plaiſter is good for all wounds in the breaſt, or other parts, for it draweth the hollow parts of all wounds, and ſtrengthens the parts, clearing them from unnatural matter, and dryeth all wounds cauſed by thruſts.

RECEIPT LIX.

Of the general ſignifications of ſickneſſes, either preſent or near at hand.

THeſe following preſages and tokens of ſickneſſes are worth the obſervation of all men; Firſt, to prepare themſelves for God, if he be pleaſed to call them; otherwiſe that they may in time, before they be too much ſpent, have the counſel and help of learned and expert Phyſicians.

Signs of Sickneſs are theſe.

If the body be hotter, colder, moiſter, dryer, leaner, fatter, or the colour more pale, or more ſwarthiſh, or the eyes more hollow than they were accuſtomed to be, and on the ſudden change, all theſe are certain fore-runners and meſſengers, that the body is diſpoſed to ſickneſs, or already ſick.

RECEIPT LXI.

Of the ſignification of the ſeveral colours of ſome urines.

THe colours and Symptoms of Urines are many and various, as are the Diſeaſes, and therefore ought to be

be judged on by the learned: but thus much in brief.

Red and thick urine, betokeneth sanguine.

Red and thin, betokeneth melancholy.

White and thick, signifieth flegm.

White and thin, betokeneth melancholy.

The highness of the colour signifieth heat, but the pale, black, or green, betokeneth cold.

Also, the grosness, or thickness of the urine signifieth moisture, the clearness, or thinness, dryness.

Urine of the colour of bright Gold, or of the colour of Gilt, signifieth perfect digestion, or health.

Red as a red Apple, or Cherry, or base red like bole Armoniack, or red like glowing fire betokeneth excess of digestion.

Clear and white like water, or gray as a horn, or white like whey, or the colour of a Camels hair, signifieth lack of digestion.

Pale, like to broth, or flesh sodden, betokeneth the beginning of digestion.

Citrine colour, or yellow, sub-citrine, or paler, signifieth the middle of digestion.

Colour of a Beasts liver, or of dark wine, or green like to Cole-worts, sheweth adustion of humours.

Urine of a leady colour, or black as Ink, or black as horn, or dark above, and clear beneath, betokeneth feebleness of nature, mortification, and death.

The

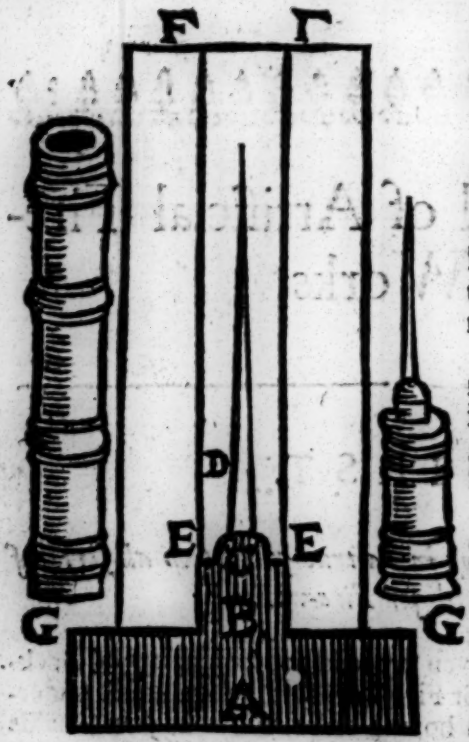
The School of Artificial Fire-Works.

FIRST.

The order and making in a true proportion all sorts of Moulds for Fire-works.

BEfore you proceed to the making of Rockets for Fire-works, it is requisite to understand how to order, and make your Moulds and other instruments for the same, and first for your moulds you must provide a piece of good dry Box, Holly, Walnut-tree, Crab-tree, or some such like tough wood, without shakes or knots, and when you have thus done, it is fit to know of what length and breadth you desire to have your Mould, for following this kind of proportion, all other sorts of moulds are made great and small, therefore you ought to have a Turner to turn and bore the same: as for example: I would have the hole of a Mould bored but an inch diameter, or wide, then the length of the Mould must be six times so long as the hole is wide (which is six inches) and on each side of the hole half an inch thick: So that when the Mould is turned round, it is two inches over in breadth. When you have done this, you must have a bottom made, that

is



is to be fitted in this manner, as is described by the letters in the Figure following.

A. Is the foot of the Mould, and must be in height two inches, and must be in breadth an inch and a quarter, whether it be square or round.

B. Serveth only for a stay, and must rise one inch into the Mould, and so proportionable in all other moulds.

C. Is for the mouth of the Rocket, and is in breadth two third parts of an inch, and then setting one foot of a pair of Compasses in the middle or center, describe the arch, which is the full height required.

D. Is the length and bigness of the Needle, which is two third parts, the length of the mould and the bigness of the bottom one sixth part, the breadth of the bore, and taper toward the top.

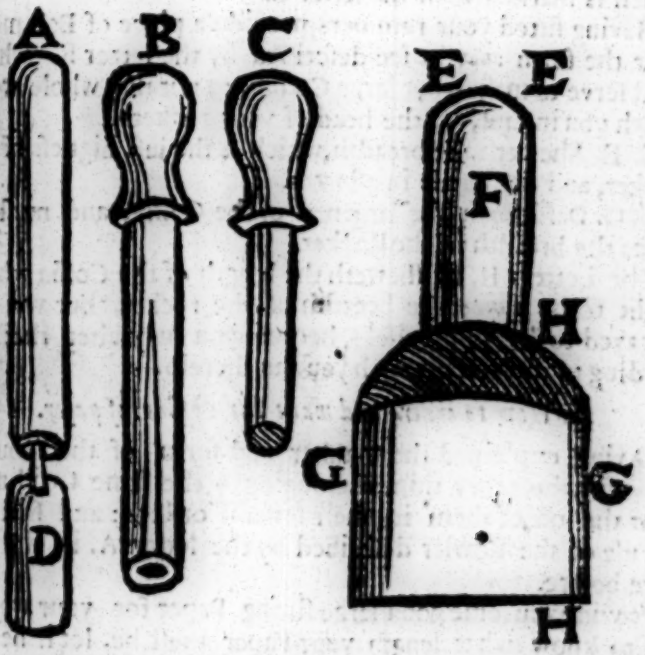
F. E. Serveth for the Paper being rouled, and must be one sixth part of the breadth on each side.

F. F. Is the thickness of the mould, which is half the breadth of the bore, that is in this mould half an inch.

F. G. Is the length of the mould, which is six times the breadth.

2. *The order and making of Rowlers, Rammers, and other things for the Coffins.*

HAving provided your mould, then you are to fit your Rowler, which must be two third parts of the breadth of the bore of the mould, and the length thereof six inches longer than the mould, which is for rouling of your paper, and is described by the letter A in the figure following,



ing, with a hole to be bored in the bottom to receive a Wyre, which must be fastned in another piece of wood some-what shorter, to take out at your pleasure, which is described by the letter D, the use thereof shall be described, when I shall shew the order of making the Coffins.

When you have fitted your rocket, then proceed to the making

making of your rammers, which must always be two at the least, for each several Mould as they increase in largeness, you must be fitted with several rammers, by reason of the Taper Needle: the manner and form is described by the letters B, C, in the figure following.

B. Is the hollow rammer, and hath a hole in it answerable to the length and bigness of the Taper Needle, it must be small matter less than the rowler, because that otherwise putting it in, you will put down the paper. The other rammer is not half so long, and fad, that when you have beaten to the top of the Needle, you may make use of this which is marked with the letter C.

Having fitted your rammers, provide a piece of Box made after the form as you see described by the letter F. which must serve to make your large Coffins, to put the whole work which you intend, on the head of your rockets.

E. E. Sheweth the breadth, which is the just bigness of the Rocket, and must be so in all sizes.

G. G. Describeth the largeness of the Coffin, and must be twice the breadth of the Rocket.

The Letters H, H, sheweth the length of the Coffin which ought to be twice the breadth of the rocket, but you are not tyed to that so precisely, because you may alter that according to the work which you put therein.

3. *How to order, and make the Coffins of paper.*

HAving explained the manner and form of the mould, with the other things belonging to the same I will now shew the use of them in their several orders: and first for the use of the Rowler described by the letter A. in the Figure before.

Provide you some good large strong Paper for your work, and to know what length your Paper must be, let it be always the length of your mold, so shall you have one bread left above the mould, the use whereof shall be shewed hereafter. Now having provided your Paper in length ready, take your rowler and one length of Paper, and begin to roul; when you have rouled one sheet you must have a board with a handle, to roul it with, (the board is marked

the Figure following with the letter B.) which muſt be
e in this manner: you muſt hold the rouler in your left
d, and with your right hand hold the board by the han-
, and then lay down your rowler upon ſome ſmooth cheſt,
table, which when you have done, roul another length
Paper, and ſo proceed in rouling between every ſheet,
il you have rouled on ſo much, as will fill the mould very
ight. When you have thus done, draw forth the rou-
about an inch, and then take the other ſhort rouler,
ich is marked with the letter D. in the other Figure, and
it in as you ſee deſcribed, and there you ſhall have a
ce left for the choaking of the rocket, of which is next
lowing.

4. *The order and manner how you ſhall choak a Rocket.*

WHen you are to choak a Rocket, you muſt have an Iron hook, or a ſtaple driven into ſome poſt, to ch you muſt faſten your cord, which muſt be bigger or according to the bigneſs of your Rocket, by reaſon that a ll cord will not choak a great Rocket for want of ſtrength, a great cord will not ſerve for a ſmall one, in regard that it make too great a choaking, ſo that you muſt have a bigger leſs; & when you have ſo done, you muſt tye one end of

the cord to the hook or ſtaple, and at the other end, abou
yard off, tye a ſtrong ſtick, in faſhion of a ſwing, it muſt
ſtrong, becauſe it beareth the weight of the body, (as you m
ſee in the Figure following, marked with the letter K) whi
when you have provided put the ſtick between your le
and wind the cord about the Rocket-caſe in the place
pointed, which muſt be between the long rowler and
ſhort: when that is done, girt it by degrees, ever turn
the rowler, to the end it may come together more cloſe
neat, and when you have ſufficiently choaked it, draw fo
your ſhort rowler, and where the choaking is, tye it ab
with ſtrong Pack-thread, and then draw forth the row
your Coffin is ready to be filled when occaſion ſerveth,
form whereof followeth, by this letter A.

9. *The manner of driving a Rocket, with the Inſtruments belo*
ing thereto.

YOur Coffin of Paper being finiſhed, take it, and with yo
hollow Rammer, force the ſame down cloſe into
mould, and when you have done, ſtrike two or three h
blowes to ſettle the Paper into his right form: Which be
done, then you muſt fill the Coffin, in doing whereof y

muſt have a care, providing a meaſure which may contain but the twentieth part of your whole Rocket; ſo by that means you ſhall not fail, but every Rocket ſhall have a true proportion alike: as for example, I have a Coffin, which being filled, will hold an ounce of mixture, or thereabout: then I take the twentieth part, and when I find what quantity it is, I make a meaſure of horn or Latten marked with the letter F. which ſhall contain ſo much, and then I begin to fill my Coffin with one meaſure at a time, & putting in my Rammer, I ſtrike four or five ſmart blows with a good heavy mallet, and then fill another meaſure, and ſtrike again, ſo I continue till I come to the top of the needle, then I take the ſaid Rammer, and ſo continue with it, till I come to the top of the mould: now the paper which is above the top of the mould muſt be turned down and beaten hard: which being done, the rocket is finiſhed from the mould, which being forced out with as much eaſe as you can, for the leſs you force it, (being filled, and the Needle taken out,) the better it is, for knocking looſens the Powder, and ſo cauſes the Rocket for to fail. You ſhould have a Funnel to fill your ſmall rockets, which is marked with the letter G.

6 Of the Compoſition and Receipts for your Rockets.

HAving thus finiſhed your Rockets, it now reſts to kn
the Receipts: For in the making of them, the chief
thing to be regarded is the compoſition that they ought to
filled withall: foraſmuch as that which is proper to Rock
which are of leſs ſort, is very improper to thoſe wh
are of a greater ſize: for the Fire being lighted in a gr
Concave, which is filled with a quick compoſition, bu
with great violence: and ſo contrary, a weak compoſiti
being placed into a ſmall Concave, maketh no effe
Therefore we ſhall here deliver Rules and directions, wh
may ſerve for the true compoſition, or matter wherew
you may charge any Rocket; from Rockets which
charged but with one ounce of powder, unto greater, wh
require for their charge ten pound of powder: and h
follow the ingrediences for ſeveral rockets.

First, for Rockets of one ounce.

Unto each pound of good muſket powder beaten, p
two ounces of ſmall-coal duſt, and with this charge t
Rocket.

For Rockets of two or three ounces.

Unto every four ounces and a half of powder-duſt add
ounce of Salt-peter, or to every four ounces of powder-d
add an ounce of Coal-duſt

For Rockets of four ounces.

Unto every pound of Powder-duſt add four ounces
Salt peter, and an ounce of Coal-duſt, but to have it mo
ſlow, unto every ten ounces of good powder-duſt, a
three ounces of Salt-peter, and three ounces of Coal-du

For Rockets of five or ſix ounces.

Unto every pound of Powder-duſt, add three ounc
and a half of Salt-peter, and two ounces and a half
coal-duſt, and an ounce of Sulphur, and an ounce
File-duſt.

For Rockets of ſeven or eight ounces.

Unto every pound of Powder-duſt, add four ounces
Salt-peter, and three ounces of Sulphur.

For Rockets of ten or twelve ounces.

Unto the former Ingredients, add half an ounce of Sulphur, and it will be sufficient.

For Rockets of fourteen, and sixteen ounces.

Unto every pound of powder-dust, add four ounces of Salt-peter, of Coal-dust two ounces and a quarter, of Sulphur and File-dust, an ounce and a quarter.

For Rockets of one pound.

Unto every pound of Powder-dust, add three ounces of Coal-dust, and an ounce of Sulphur.

For Rockets of two pound.

Unto every pound of Powder-dust, add nine ounces and a half of Salt-peter, of Coal-dust two ounces and a half, of File-dust one ounce and a half, and of Sulphur three quarters of an ounce.

For Rockets of three pound.

Unto every pound of Salt-peter, add six ounces of Coal-dust, and of Sulphur four ounces.

For Rockets of four, five, six or seven pound.

Unto every pound of Salt-peter, add five ounces and a half of Coal-dust, and of Sulphur two ounces and a half.

Here note that in all great Rockets there is no powder used, because of the greatness of the Fire, which is lighted at once, which causeth too great a violence, and therefore ought to be filled with a more weak composition.

Now when you have provided your Powder, you must first meal it, and then search it, so that it may be free from all corn, though never so small. Likewise take good dry Coal, well burnt, and beat it to dust: searcing it very fine, which when you have done, mix them according as your occasion requireth, and follow your directions.

The manner of heading a Rocket, with the order of capping it.

IN the manner of heading a Rocket, you must use the thick Rowler, which you may see described by the letter in the second figure: upon which you must rowl some Paper or fine Past-board, and paste it so that it may be very

close, and then choak it at the length of the thicker part, that it may come close to your stick in the lesser p which will be fit to be tyed to the top of the Rocket: shall you have a Coffin to put in your works, which must of divers sorts: This being done you must provide ta Caps, which must be joyned to the top of the large Coffi The use of them is to keep in your works, and to ca them to pierce the Air more swiftly. The manner of m king these Caps, is to take a pair of Compasses, and describ circle in a Past-board; then cut it out with a pair Sheers, and that will make two caps, being cut in the mi dle, and turned one corner under the other, and so paste and let them so pasted, be put in a Napkin-press till th be dry, and when they be dry, cut out a half circle in Pap which shall sit round about the said cap, and shall serve paste on the cap to the coffin; So you have all things ready the finishing of your Rocket, which must be done in the m ner which followeth. R. in the next figure, is the crack fastned to the top of the Rocket, S. is the cap, T. is the Fig finished, H. is the stick tyed to the Rockets.

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8. *The manner of fastning a Rocket.*

HAving driven your Rocket, as I have shewed, with Paper turned down, you must first prime it, whi must be with cotten wick made for that purpose, which must put into the vent, leaving a piece to hang lower th the mouth of the Rocket by three or four inches; whi being done, tye a piece of Paper over the mouth, that it m not fall out. Now having primed your Rocket, you m proceed to the heading of it, and that is done after manner.

Take your Rocket, and on the head you should turn do the Paper, you must with a Bodkin pierce two or thr holes, that when the Rocket hath spent it self, the wo which are in the head may take fire; which holes pr with a little Powder-dust, and then put on the head, w the choaking fitted to your Rocket, which must come ov

the ſame in ſuch manner, that the bottom of the greateſt part muſt come even with the top of the Rocket; which tye faſt to the Rocket with thred, and then put in your works; but before you put in your works, whether they be Stars, or any other works, you muſt put in a little cotten-wool, being rouled in Powder-duſt, to make your Stars to take fire, or likewiſe may blow out: Having thus done, put in your Stars, or other works, and if you make more than one fire, (as you may do of your Stars) then you muſt put more Cotten rouled in powder duſt among them, or between every fire, that they may all take fire; then take your paper, and fill the hollow place with Cotton, becauſe it is light, and likewiſe will fire quickly; which being fitted, drive it cloſe to the top of the coffin, that it may ſtand upright; then muſt you fit your ſtick, for the poyſing of your Rocket, which ought to be eight times the length of the Rocket without the head: You muſt get the ſmootheſt and lighteſt you can, ſuch as Basket-makers uſe, and then cut one ſide of it flat at the great end, then make two notches on the round ſide, that the one be differing from the other, ſo much as is between the choaking of your Rocket, and the end of the Vent, for if you ſhould tye it upon the Vent it would looſen the Powder, cauſing it to break in the Firing: be careful that you tye not the wrong end of the Rocket upper-moſt, but tye that end downward that is choaked, and with a piece of thread that is ſtrong, tye it to the lower notch about the choaking. When you have tyed that, then tye the other higher, and let the ſtick come even with the top of the Rocket, the manner whereof is ſhewed in the next figure, by the letter G. Then poyſe your Rocket, by laying it on your finger two or three Inches from the mouth; and if you find the ſtick be too heavy, cut it ſhorter, till you find your rocket to balance your ſtick; for if the ſtick be too heavy, the rocket will be a ſlug, and being too light, the rocket will fall before it be half up. Theſe things being provided, you have your Rocket ready to be fired, which muſt be after this manner following.

9. *The manner of firing Rocketts, with the description of a Staffe for the same.*

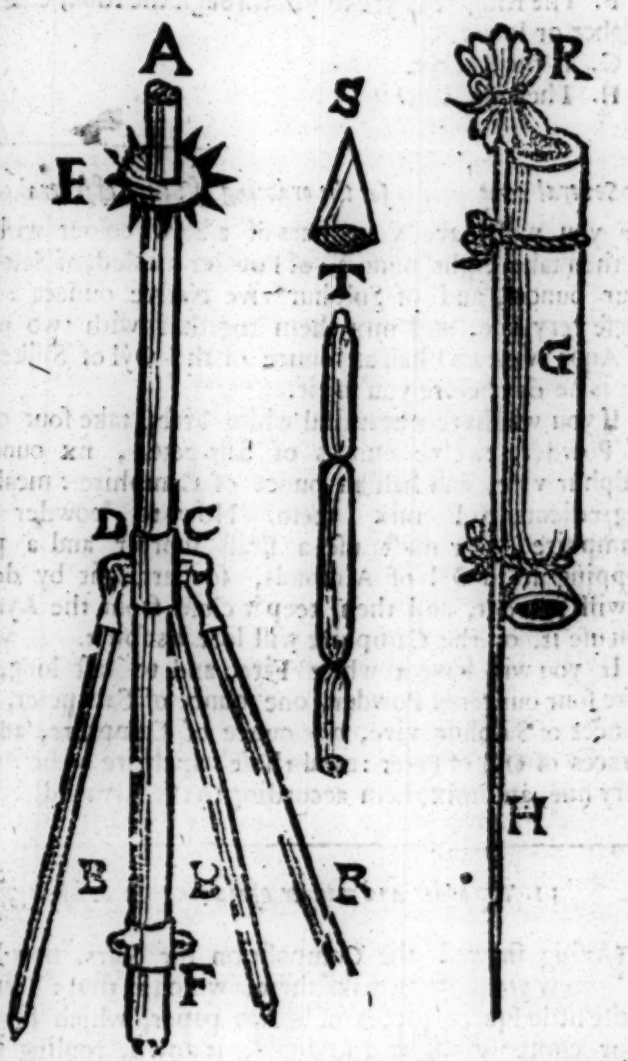
YOu must provide a long staff, with a Pike at one end to be thrust hard into the ground, with a three-legged staff, having a hollow hoop at the top, to let this long staff slide up and down, to the end that having Rockets whose sticks are longer than the staffe, yet by raising it through the said Iron hoop, you may make it four or five foot lower than it would be, standing on the ground. Now this long staffe must have a sliding place cut with several pores which must be near the top; and at the bottom there must be a ring of Wyre, to let the stick go through; which must be made likewise to slide up and down, so thrust the small end through the said Ring, your rocket will stand upon that part above, which must be just opposite in a streight line; so open the mouth of your Rocket, and put out the end of your Cotten-wick, and with a piece of Match fastened in a Linstock, give fire to the wick, and by degrees you shall see it fire your Rocket; which ordered well, will mount very streight and high. Thus having shewed the whole order of composing a rocket, with firing of the same, I will in the next place shew you the order of making of stars, and other works, which are necessary for the heads of your rockets. The Figure of the rocket and the staffe are here presented.

The Letter G. is the rocket with the long stick.

A. The long Staffe to rise through the ring.

B. B. B. The three legged Staff.

C. The Ring or Hoop of Iron, for the long staff to slide through.



D. The Screw to faſten to the long ſtaff being raiſed.
E. A piece of Iron filed with notches to hang the Rocket on.

F. The

F. The Ring of Wyre to put through the ſtick, to be ri
higher or lower.

G. Is the Rocket.

H. The long ſtick.

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10 *Several compoſitions for the ordering of Stars of ſeveral colo*

IF you will have your ſtars of a blew colour with re
then take eight ounces, of Powder mealed, of Salt-pe
four ounces, and of Sulphur vive twelve ounces: Me
theſe very fine, and mix them together with two ounc
of Aqua vitæ and half an ounce of the Oyl of Spike, a
let it be dry before you uſe it.

If you will have a beautiful white Fire, take four ounc
of Powder, twelve ounces of Salt-peter, ſix ounces
Sulphur vive, and half an ounce of Camphire: meal yo
ingredients and mix them. Now to powder yo
Camphire, you muſt uſe a Braſs mortar and a peſt
dipping it in Oyl of Almonds, ſo ſtirring it by degre
it will powder, and then keep it cloſe from the Ayre t
you uſe it, or the Camphire will loſe its ſpirit.

If you will have a white Fire, and to laſt long, th
take four ounces of Powder, one ounce of Salt-peter, eig
ounces of Sulphur vive, one ounce of Camphire, and t
ounces of Oyl of Peter: meal thoſe which are to be meal
very fine, and mix them according to the former directio

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11. *The order and manner of making the beſt ſort of Sta*

HAving ſhewed the Compoſition for Stars, now I w
ſhew you how to make them, which is thus: You m
make little ſquare pieces of brown paper, which fill w
your compoſition, and ſo double it down, rouling it t
you make it ſomewhat round about the bigneſs of a
or bigger, according to the ſize of the Rocket, you may
In a dozen on the head of a ſmall Rocket, binding th
round with a thread, and then draw a cotten wick thro
them, being prepared for priming.

Alſo there is another way which is thus; take a ſmall owler, about the bigneſs of an arrow, and roul a length paper about it, and paſte it round, letting it dry, and hen you have a hollow trunk of this paper, fill this with our ingredients, thruſting it hard till it be at the top, nd then cut it into ſhort pieces, about half an inch long, nd then in warm glew dip one of the ends therein, and them drie, to the end that both ends of your Stars fire ot, and then put the other end into Powder-duſt; you ay put them on your Rocket, in one or two tires, ming in Powder-duſt between every tire, that they may ake fire.

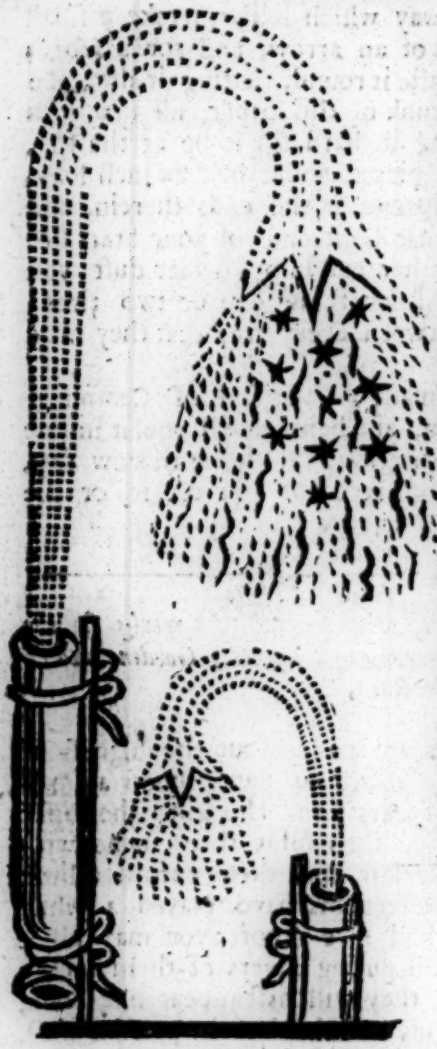
The priming is thus made; Take Oyl of Camphire aking cotten wiek therein, and being moyſt roul it in fine wder-duſt, and then hang it up till it be thorow dry, nd then keep it cloſe from ayre till you uſe it, or the irit of the Camphire will decay.

The order and making of other ſeveral Fire-works for the Rocket, as Serpents, or Fiſgigs, Reports, Golden and Silver Rain, &c.

The Serpents or Fiſgigs are made about the bigneſs of ones little finger, by rowling a paper upon a ſmall owler, (as it was for your Stars) and choaking the paper Coffin an inch from the end, then fill it three inches with owder-duſt, and then choak it, and then put in a little orn powder, when your ſerpents have played a while o and fro, it may break and give report: you may fill it ith the Star mixture, and puting divers of them on the ead of the large Rocket, they will firſt appear like Stars, nd when the Stars are ſpent, take hold of the powder-duſt, nd they will run rigling to and fro like Serpents, and at ſt will give ſo many reports, very delightful to behold.

The reports are made in their proper caſes as the erpents are, but the paper muſt be ſomewhat thicker, hich will cauſe it to give the greater report: Theſe are to filled with grane powder, or half powder and Star mixture.

To



To make the gold Rain, you muſt get ſm of Gooſe-quills, and c them off next the ſe thers, and fill theſe qu hard with the ſame co poſition that is in yo Rocket, and muſt be p on the head of the Roc et with the open e downwards: If it we poſſible to put a thouſa of theſe quils upon t head of a Rocket, it we a dainty ſight to ſee ho pleaſantly they ſpre themſelves in the air, a come down like ſtrea of gold much like t falling down of Snow, e pecially if the wind b any thing high.

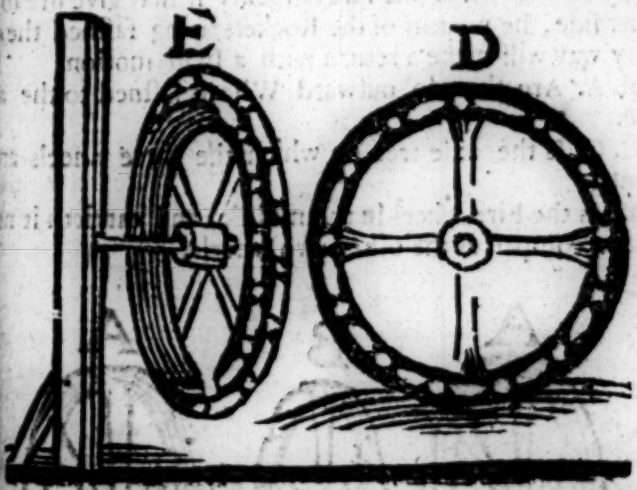
If you will make ſilv Rain, it is performed the other, only you m fill your quills with t ſame ingredients th you did your whi Stars.

13 *How to make your fire-works to run upon a line backwa and forward.*

TAke ſmall Rockets, and place the tail of one to t head of the other, tying a Cane to them to run on a ſtr

ſoped

ged; the line may be a hundred yards long, or longer if
pleaſe, being well ſtretched and ſet on ſtakes, as you
ſee in the figure following; as admit the line to be
CDEFG. and, if you give fire to the Rocket at A, it will
to B, and then come back again to A. Then fire another
C and that will fly to D, and back again to C, and ſo of



reſt: And at the laſt (if you pleaſe) may be placed a
of Fire-works, which being fired will make good ſport,
ing Serpents and other things in it, which will variouſly
mix themſelves in the air, and upon the ground, and
ry one will extinguiſh it ſelf with the report.

How to make a Wheel of Fire-works to run forward and backward upon the ground.

You muſt get a pair of light Wheels like ſpinning Wheels,
both of a bigneſs, which muſt be faſtned to a ſmall
axle-tree, in ſuch manner, that they may not move
the ſame, and on the middle of the axle-
faſten alſo a Fire-wheel (as you may ſee in the
re following) which muſt not be ſo big in compaſs as the
other Wheels, becauſe it muſt not touch the ground, ſo

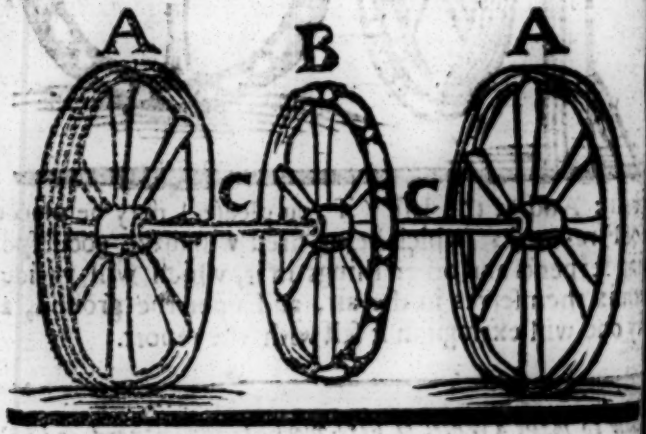
that

that being fast in the middle upon the same axle-tree cannot run unless it carry the other Wheels with it; which being set on an even ground, will run a great way without ceasing: now that you may make it return back again when it hath run its course forward, you may make your middle Wheel in such manner, that it may have Rockets on both sides, so that when one side is spent, it may give fire to the other side, the mouths of the Rockets being fastned the contrary way will make a return with a swift motion.

A. A. Are the two outward Wheels fastned to the axle tree.

C. C. Is the axle tree on which the three wheels are fastned.

B. Is the Fire-wheel in the middle, and carrieth it no great a compass as the other two wheels.



15. *Another way for a single Wheel to be placed on a post to run both ways.*

THis may be performed with a single wheel, so that Rockets may be placed on each side (as in the middle wheel) with a hole from the one side to the other a vent; then place your Rockets first upon one side (

the laſt Rocket be placed over the ſaid hole) and boring a ſmall hole in one ſide of the laſt Rocket, put in a cotten wick for priming, letting it come through the hole in the wheel, to the mouth of another Rocket which ſhall be turned the contrary way on the other ſide: ſo that the Wheel having finiſhed its revolution one way may take fire on the other ſide, making a retrograde motion: but if you place the Rockets all one way on both ſides, it will continue twice ſo long as another of the ſame bigneſs, the form of which is expreſſed in the Figures following.

D. Is the wheel with Rockets on one ſide, the laſt Rocket to have a vent to paſs through to the other ſide.

E. Repreſents the ſaid wheel finiſhed, with Rockets on both ſides.

The order to make a fixed wheel, ſtanding upon a Poſt, giving divers reports.

THere muſt be a wheel turned two foot wide, and out of the upper ſide muſt be a groof turned half an inch wide and half an inch deep, to which groof you muſt have a piece of wood ſo fitted, that it may juſt ſlide in, which piece of wood muſt have ſo many ſmall holes bored in it as you will have

have reports about it, and be ſure you ſet them not near together, leſt the fire of one beat the other down ving thus provided your wheel, you muſt make a convey hollow Trunk of paper, which will juſt fill it, and fill

ſame with ſome your ſlow mixture ſtars, and then ting on the cap wood ſo fitted holes, being made with glew, pierce ry hole into your low conveyance ſo putting a quill in very one, they take fire, and to quill faſten a Repo ſo ſhall you have peal of Chambers ced in a ſmall roo which being once red, will follow in der, till the wh train be ſpent. hold the Figure ma ed with A.

---

17. *Another fixed Wheel upon a poſt, which will caſt ſo many Rockets into the Air.*

THis Wheel is not much unlike the former, which give Fire to divers Rockets ſtanding circular, differing tle from the former, only you muſt make a hole for every to paſs thorow, as it is in the Figure B. and therefore it be made ſomewhat broader, which will work the like effe that the other doth, by conveying Fire from one Rocket another, till they be all ſpent.

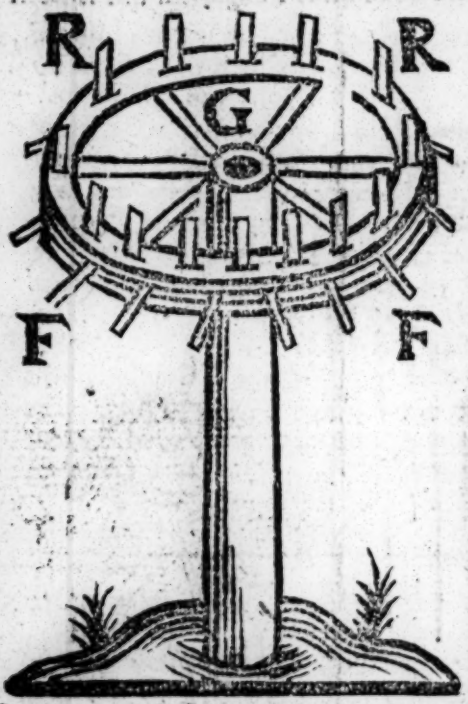
The mixture for this conveyance muſt be very ſlo

therefo

herefore uſe theſe Ingredients: Take eight ounces of Roch
ter, four ounces of Sulphur vive, half an ounce of Cam-
hire, two ounces of fine Powder-duſt, and meal theſe very
e, and mingle them together, adding half a quarter of an
nce of Linſeed Oyl, and as much of the Oyl of Peter, theſe
les muſt be dropped in by degrees, and ſo wrought up,
you find your mixture bound like Dough, and this is both
w and ſure.

18. *Another dainty fixed Wheel, which will caſt forth diver Fiſgigs, or Serpents, and as many Reports.*

YOu muſt have a Wheel turned with a groof on the t thereof to put in the conveyance of paper, then fi a piece of wood (as it was before ſhewed) with ſmall h



to put in quils, wh are for Firing y reports, and muſt placed round ab the upper part your wheel, and the ſide thereof vers holes muſt made of the big of your Fiſgigs, wh muſt be pier through to the pa conveyance, t Fiſgigs that are ced round on ſides and the repo on the top, one t will Fire them and in firing ſhall ſee all the Fiſ flying round abo one after another the fire paſſeth them; and for every Fiſgig which paſſeth out ſhall be fir a report; ſo that there ſhall be a continual motion, un whole train be conſumed.

the Is the Wheel with reports and Fiſgigs.

G. Is the Reports on the upper part.

R R Is the Fiſgigs on the ſide of the Wheel.

F F.

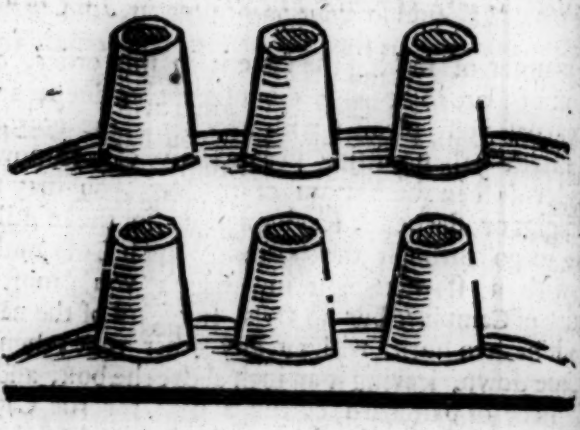
15. A

Another. dainty one with Fiſgigs, called Jack in a Box.

The manner of making the ſame is in this order, cauſe a box of ſlate to be made about ſix inches deep, and of at compaſs you pleaſe (with a ſocket at the bottom to in a ſtaffe) then putting in a quantity of corn-powder, powder-duſt in the bottom of the box, you may fill it Fiſgigs or Serpents, leaving a place in the middle for Cane to go through the bottom, which Cane muſt be d with a ſlow receipt in which you muſt put uantity of Camphire but no Oyls, in regard of the narrow ge it hath to burn, without any other vent; then put Cane down, leaving it an inch above the box, and take ick piece of paſtboard, cutting a hole for the Cane to through, and glew it cloſe to the Cane, that the Fire not through before its time: this paſt-board muſt be fficient breadth to cover the box quite over, then it on a ſtaffe and light your Cane, which will appear like a Candle, and after a little ſpace of time you ſhall a ſudden noiſe, and ſee all thoſe Fiſgigs flying, ſome way, and ſome another: This hath given good content the beholder, you may if you pleaſe make Clubs or es of the ſame.

Of Pots of Fire for the ground, which will make the Air rebound with their reports.

Many Pots being fired together, do give a fine repreſentation and recreation to the ſpectators; for thoſe being filled with balls of fire, or flying Serpents for air, will ſo intermix one within another in flying here there a little above the ground, and giving ſuch a volly reports, that the air will rebound with the noyſe, and whole place be filled with ſundry ſtreams of pleaſant ; which Serpents will much trouble thoſe near the place defend themſelves in their upper parts, and they will no leſs bufied by the balls of fire which will ſeem to oy their feet.



21. *The making of a Fire-ball for the ground, which will be in continual motion.*

YOu muſt get a ball turned of ſome light wood, and let it be ſawn through the midſt with a thin bow- then make on each ſide a hollow groof to lay in two R ets (joyned together after the manner of the Runn and then cloſe up your ball with glew; only in the p where the two Rockets joyn, ſhall be a groof, which be paſted over with paper, that the ſecond Rocket t fire may have a vent, otherwiſe the ball will ſerve but o then fire it, and you ſhall ſee the operation with plea

22. *The making of a Ball for water, which ſhall burn great violence.*

SOw a round Caſe of ſtrong Canvas, in ſhape of the for a Foot-ball, but ſomewhat leſſer, and very ro having thus made your caſe, then proceed to the fi of it, which muſt be done in this manner: You muſt put in three or four good ſpoonfull of your mix following, and with a ſtick made round at one end,

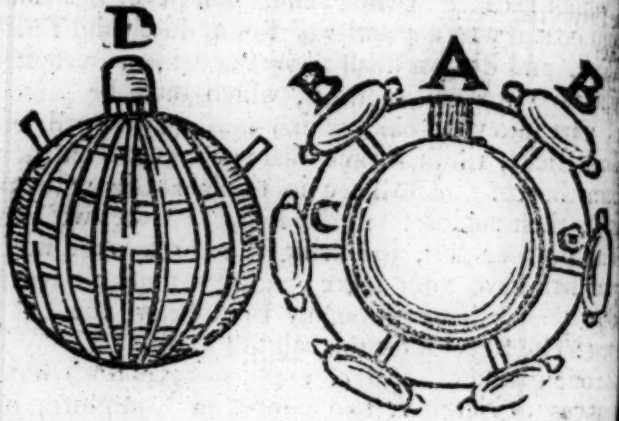
cloſe together, and ſo continue filling it, and between ery filling put in your ſtick, and force it together, round continually in your hand till you have finiſhed it; which ing done, ſow it up cloſe, and then arm it with ſmall d, which is called marling; after you have thus done, muſt coat it with a quantity of Roſin, Pitch and Tallow diſſolve, and dip your ball all over in the ſame, provided you leave two vents to fire it, which muſt be pierced ird part into your ball, which muſt be ſtopped with ſmall ſticks, till ſuch time that you come to uſe them, form thereof you ſhall ſee in the next figure by the er D, then pulling forth the ſticks, fill the two vents fine powder-duſt, and firing it, caſt it into the water, you ſhall have your deſire; but you muſt alwayes be that your ball be throughly fired before you caſt it you: The Receipt for this ball followeth.

ke one pound of Powder, eight ounces of Roch-water, ounces of Sulphur, two ounces of Camphire, one e of oyl of Peter, one ounce of Linſeed Oyl, half an e of Oyl of Spike, and two ounces of Colophonia.

Another dainty Waterball, which will ſhoot forth many Reports.

is Ball muſt be made of wood (as was ſhewed before) two pieces, becauſe you may joyn it cloſe together eaſure, having ſmall holes bored round about it, to in your quills which juſtifie the Reports, which reports eakers muſt be made of paper, choaked at both ends primed through the midſt; they muſt be faſtened round pitch, and ſo covered round about, that no water paſs in: you muſt fill this ball in two halfs, that you force it very cloſe together, and when it's filled, glew , and arm it well with nealed wyer, then put in your ers, with a quill which muſt enter into the ball, and ſe into the breaker; the form whereof you may ſee Figure following: For A. is the mouth of the ball e it is to be fired, B. B. are the reports or breakers,

being made of paper, and filled with Corn-powder: C are the Quills, which must be filled with powder-dust ſerveth for firing the Reports.



The Receipt for this ball in this; Take one pou Roch-peter, four ounces of powder-duſt, three ounce Sulphur-vive, two ounces of Camphire, one ounce of L ſeed-oyl, two ounces of Roſin, and one ounce of Oyl be dict, you muſt powder thoſe things which are to be p dered, and mingle them all together, and by little and l ſprinkle your Oyls, till you have wrought it like Paſte, then uſe it: the quills muſt be filled only with pow duſt, becauſe it muſt fire ſuddenly.

C

24. *How to make a Dragon, or the like, to run on the ſpitting of fire.*

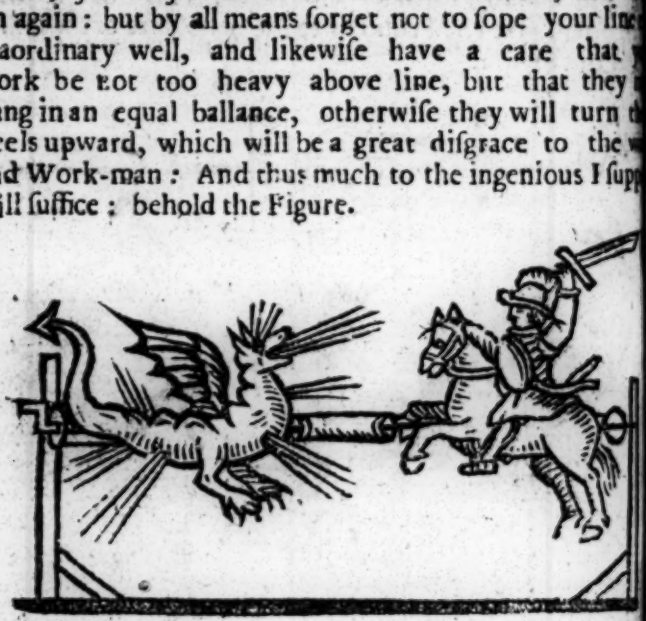
THe body of the Dragon muſt be made either with board, or with fine rods of wicker, being hollow, a place in the belly to put in two Rockets, and muſt ordered, that there may come a ſmall Pipe from the the one, to the head of the other: then make a place eyes, and mouth, to put into each hole fire, muſt be made up in rouled Paper, and thruſt in, the

top of the back, let there be faſtned two ſmall Pullies a Line to run in, which being done, your Dragon is fi-ed for firing, which muſt be thus: firſt ſet it at the eyes mouth, (always obſerving that this receipt muſt be ſlow mixture, ſuch as your ſtars) then fire that cket which is placed with his mouth towards the tail of Dragon, which will make it ſeem to caſt fire from thence he come to the end of his motion; and then on a ſudden a creature wounded with ſome accident) ſhall return fire coming forth of his belly: This being well ered, will give good content to the beholders of the ſame; old the Figure.

The manner and form to repreſent Saint George *fighting with a Dragon in Fire, on the Line.*

WHen you have formed your Figures of Paſt-board, or Wicker (as aforeſaid) you muſt make a hol-trunk through the body of each Figure, for a great Line ſs through, and likewiſe for a ſmaller Line to draw them and fro from each other, which muſt be faſtned in this ner (as you may ſee in the Figure following:) At the

breaſt of the Dragon let one end of one cord be tied, wh
muſt paſs through the body of the George, and turnin
about a Pulley at the other end, faſten it to the back of
George, and at the breaſt of the George let another cor
tyed, which muſt paſs through the body of the Dragon
a trunk on the back) and ſo returning about a Pulley
that end, muſt be pulled ſtreig t and faſtned to the ta
the Dragon, ſo that as you turn that Wheel, the George
Dragon will run furiouſly at each other: and when
pleaſe, you may cauſe them to make a retreat, and c
on again: but by all means forget not to ſope your line
traordinary well, and likewiſe have a care that
work be not too heavy above line, but that they
hang in an equal ballance, otherwiſe they will turn t
heels upward, which will be a great diſgrace to the
and Work-man: And thus much to the ingenious I ſupp
will ſuffice: behold the Figure.



26. *How to make a Whale, a Mermaid, or other to play
ſwim upon the water.*

YOu may make Figures of what ſhape your fancy
pleaſeth: the body muſt be made of light wi
rods, and in the midſt of the body let there be place
axle-tree, having two Wheels coming into the water, yet
as they may not be ſeen: theſe Wheels muſt be made
low, to contain a quantity of ſand or water: the uſe of

to keep the body of your Figure upright, and able to ſink it ſo far into the water as is needful, and likewiſe to make it ſwim too more ſteady: note that theſe Wheels muſt be looſe, and the axle-tree faſt: in the midſt of this axle-tree, place three or four great Rockets one by another, with their mouths all one way: yet ſo provided that there may be ſuch a diſtance between each Rocket that there may come a vent from the tail of the firſt to the mouth of the ſecond, and from the ſecond to the third. And to the end that it may continue the longer in motion, you may place divers lights about the body, to make it the more beautiful; every of which lights extinguiſhing ſhall give a report, and ſo conclude. There are divers other fine Works to be performed on the waters, which a judicious Artiſt may invent.

The Letter B. repreſents the Mermaid.
C. is the Wheels on the axle-tree.
D. are the Rockets on the axle-tree.

27. *Of divers other rare Works, which are to be performed on the water.*

THoſe places which are ſituated upon Rivers or great Ponds, are proper to make theſe recreative Fires on; therefore if you deſire to make ſome of conſequence, they ought to be built upon Boats, or light timber, which may be framed like Beaſts, or Fiſhes ſpitting of fire; upon which may be built Caſtles, Pageants, Turrets, or other conceits as you pleaſe. As if you would preſent a Caſtle out of which ſhall iſſue a Dragon, which ſhall ſwim through the water, and that Dragon be encountred by a horſeman, which is thus performed. Cauſe a Caſtle to be framed (as is ſhewed) on light timber, and let the bottom of the door of the Caſtle with a ground-plat be two foot under the brim of the water, (the reaſons follow) and at a foot high within the Caſtle let there be a certain line tyed which may paſs through the body of the Dragon, and may be faſtened near the ſhoar where muſt be a float ſunk ſo far under water that the line may not be perceived; then faſten on your Dragon (as was ſhewed before for the line) but ſo that the head of this may always be above the line, whereas the other was under, then at the appointed time, there muſt be one ready within the Caſtle, to fire thoſe parts of the Dragon which are requiſite; which being done (by the help of the pulleys) ſhall paſs it through the water which ſo ſoon as it preſents it ſelf, *Neptune* on a Sea-horſe ſhall come, and encounter the ſaid Dragon, and at laſt ſhall overcome it: Or you may order the work ſo that which you pleaſe ſhall have the victory; for that which keepeth fire longeſt, is ſuppoſed to have the beſt, and that which is ſooneſt ſpent, to have the worſt.

G. repreſenteth the Caſtle floating on the water, from whence iſſueth the Dragon.

E. is the Drag on coming forth of the Caſtle.

D. is *Neptune* riding on the Sea-horſe, coming to encounter the Dragon.

F. is the Pully that cauſeth theſe motions by the Line to be pulled to and fro.

You

You may if you please, build upon Boats, or Timber, Turrets, Pageants, or Castles, as is said, to receive or hold diversity of Fire-works that may be made within them, which may play out, and play divers Fires, as Reports, Stars, Golden Rain, Fisgigs, Granadoes, and Balls of Fire to burn in the water, which will give great content to the eyes of the beholders; and in the conclusion, it may be so ordered, that they may fire one another, for which end they were made.

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28. *The manner to compose a Ship of Fire-works, which being once fired, divers motions will present themselves.*

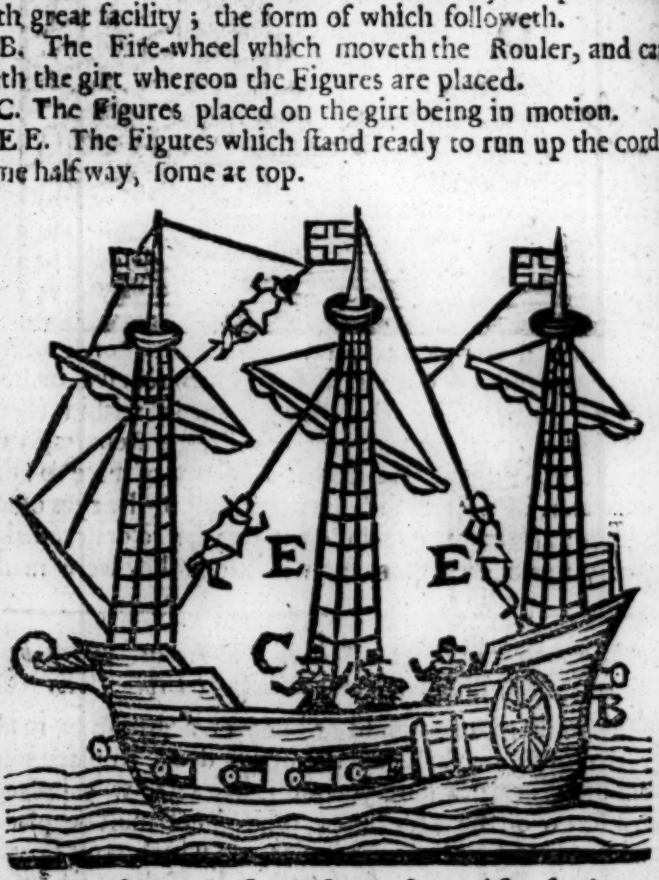
YOu must make a mould or body of a Ship to be made that you may take off the upper deck, to place some works underneath, where you must have a fire-wheel placed with a screw on the Axle-tree; this Wheel must be placed in the stern, and must turn a rouler, on which must be two girts placed, that must pass on each side of the main mast, and run on to the foreship; in this Wheel there must be a hollow spoke and axle-tree, as I have shewed, which must be so ordered, that the Wheel being spent, it may convey fire to a tire of Guns, lying round about, which must be fired with a close conveyance; and having passed that, it must take

take hold of another conveyance which ſhall give fire to certain Rockets, which muſt be placed in the body of ſome figures repreſenting mariners, and muſt be ſo fitted that they may have a Cane joyned to their body to guide them, that they may run on the ropes from the Deck to the top of the maſts. This and other the like may be performed with great facility; the form of which followeth.

B. The Fire-wheel which moveth the Rouler, and carrieth the girt whereon the Figures are placed.

C. The Figures placed on the girt being in motion.

E E. The Figures which ſtand ready to run up the cords, ſome half way, ſome at top.

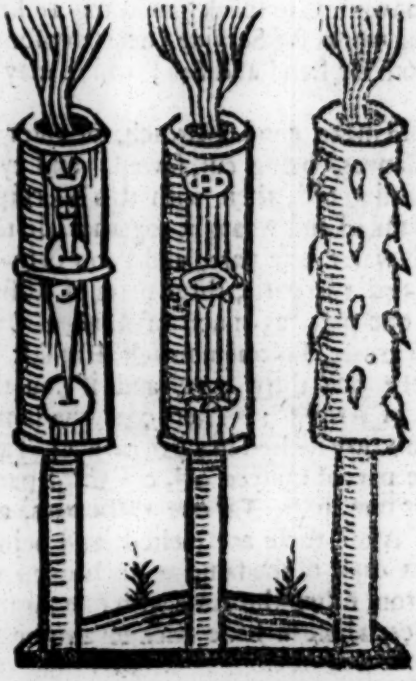


29. *Of Launces of Fire for pleaſure and for ſervice.*

STanding Launces are commonly made with hollow wood, to contain ſundry Petards or Rockets; theſe Lances may be faſtened to poſts, ſo that they may not be overthrown in the flying out of the rockets or Petards: but there are a leſſer

leſſer ſort of Launces, whoſe caſes are of three or four foldings of paper of a foot long, and about the bigneſs of ones finger: the compoſition wherewith theſe Launces muſt be filled is this: Unto every four ounces of powder you muſt add two ounces of Salt-peter, and unto that add one ounce of Sulphur; and then it will make a brick fire red colour before it be half ſpent, if the Launce be fired and held to it: Now if twenty ſuch Launces were placed about a great rocket, and ſhot to a houſe or ſhip, it would produce a miſchievous effect.

Or, if unto the end of the rocket there were faſtened an arrow (which muſt not be too heavy) and inſtead of the feathers, it ſhould be of thin white tin plate, and if you give fire to it being thus prepared, you may ſee how ſerviceable it will prove. To the head of ſuch rockets may be placed Petards, balls of Fire, Granadoes, and the like, and ſo may be applyed to warlike affairs.



Here

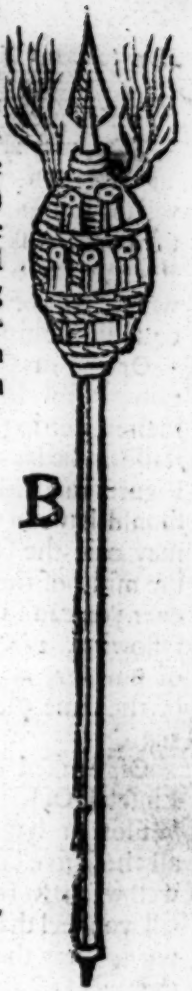
Here follow Neceſſary and ſerviceable Fire-works both for Land and Sea Execution, and firſt for the Pike.

HAving treated of Recreative Fire-works, I hold it convenient to ſpeak ſomething in brief concerning works for Service (neceſſary for theſe times) both for Land and Sea; which may thus be performed.

If you would make good a Breach, or enter a Ship, then take ſtrong Canvas, being cut, ſewed, and tyed hard on a Pike with Marlin-cord, then with this Receipt following being compounded and wrought together, do thus.

Take Roch water one part, and Peter in meal, as much Sulphur mealed two parts, three parts of Roſin, in roch Turpentine one part, as much of Linſeed Oyl, one half part of Verdegreaſe, Bole-armoniack, Bay-ſalt, Colophonia of theſe three one third part, and if you think fitting half a part of Arſnick: Then coat the ſame over with this liquid mixture melted in a pan or pot: Take four parts of Pitch, one part of Linſeed oyl, one third part of Turpentine, Sulphur one part, Tar one third part, and one part of Tallow. After theſe are melted, and being cold, bore two holes in each of the ſame an inch deep with a ſharp Bodkin or Iron, filling the ſame with fine bruiſed Powder and put in each hole a little ſtick of two or three inches long

long, to be taken out when you would fire the ſame: (This compoſition will burn furiouſly.) If you pleaſe, you may faſten to the ſame receipt on your Pike, divers light Pipes or Canes of Iron, or Braſs of ſix or ſeven inches long, being Piſtoll or Caliver bore (as the Figure marked with B. ſheweth) placing the touch-hole thereof cloſe to the Canvas, boring the ſaid Canvas through, and priming the ſame with fine powder, paſting a paper thereon, and then coat the ſame over as before ſaid; This being charged with powder and bullet, will do great execution in a throng, either defenſive or offenſive.



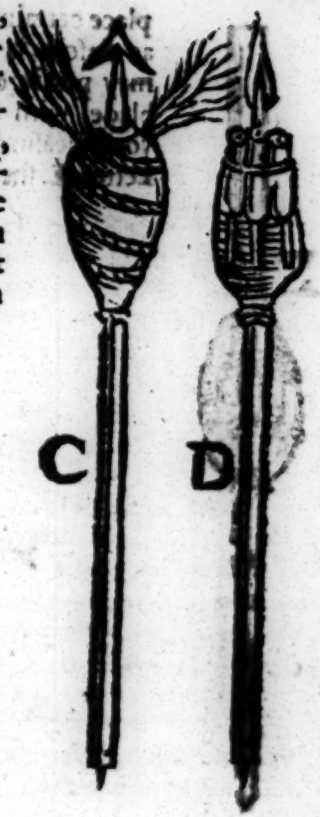
How to arm a Dart or Javelin with wild-fire, for the Sayl-sides of Ships.

YOu may arm a Dart, Javelin, Partizan, or such like weapon to do excellent service, being in the hand of a valiant Souldier, as you may see by the Letter C. in the same: The same should be filled with the self same Receipt, as before is shewed for the pikes with Wild-fire, which will be a very good weapon for to go into the sails or sails of Ships.

Or you may place upon the staffe of your Javelin certain Pistol barrels of one length, about ten or twelve inches, letting the same into the wood round about the staffe a little, as a Pistol barrel is into the stock (as the Figure marked with the letter D. sheweth) which staffe should have so much substance at the one end, whereto you may nail the same barrels fast at the breech; and about the midst of the same put over a hoop of Iron, as close as ever you can, the which is to be charged in this manner following, *viz.* First charge every barrel with two inches of powder, after put in a bullet a little lower than the bore of the same piece; then take of this slow Receipt following.

Of bruised Powder four parts, of Salt-peter in meal Linseed Oyl, Brimstone finely beaten, Varnish, and Willow or hazel cole moistned with a little Vinegar: (of all these five last Ingredients one Part;) which must be well wrought together with the hand in some wooden Vessel till you feel that it will cling together, of which you must put in after the bullet two inches, and thrust the same together with a Rammer stick; and then again put in two inches of powder, and after that a bullet; and lastly, two inches of this slow Receipt, until you have filled every one of the said barrels within half an inch of the mouth the which is to be filled up with the said slow Receipt and powder bruised and mixed together, that it may the sooner fire: This being done, bind a paper over the mouths of the same, until you will use them;

giving fire to any one of the same, it will fire all the other, and every one will discharge three or four shots a piece one after another, to the hurt of the enemy, being used in service either to offend or defend, to the pleasure of the beholders, being used in triumph with bullets of Receipt rolled in tow, and coated with brimstone.



How to enter up a pair of stairs, or to defend ones self, being in a narrow Room.

If you are streighned up in a narrow Room, to defend your self, or would enter up a pair of stairs, where you cannot use a long weapon, you may make a Logget, whose staffe shall be three or four foot long, arming the same with the same steps as was shewed to arm the pikes, whereon you may

place certain pipes of Brass or Iron, charged as before is taught: And if you please, you may put into the end of the staffe, a Rapier blade with a skrew, to take off and on at your pleasure, as the Figure marked with the Letter E. sheweth.

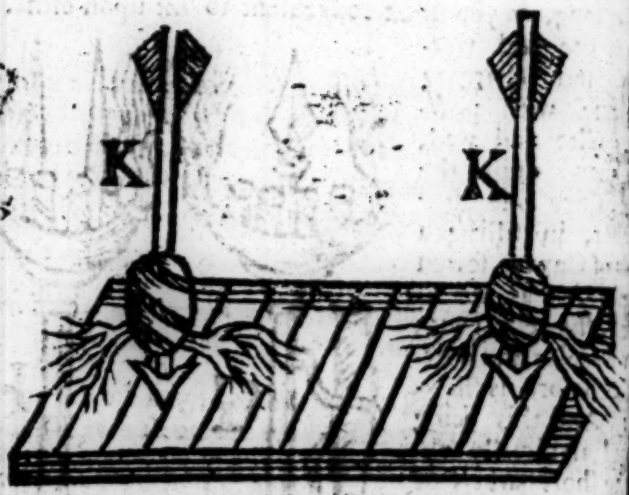
How to defend a Breach in a Ship or other place of defence.

TO perform this, you may arm a Partezan, Javelin, or both with Fire-works, and charge every one of them with seven or eight pistol of musket bullets in nailing a plate of Iron cross the pike or point of the said Javelins, or between the grates of the same, piercing certain hole through the same, unto which with a strong wyer, you may make

either ſide ſo many pipes of Iron, of ſeven or eight
ches long, as you think convenient to ſix upon either or
of the ſaid wea-
ns, and charging
e ſame with pow-
r, bullet and wad,
u may cauſe the
me to fire one after
nother, in filling a
ole of Canvas ſewed
gether, (as the fi-
re F. ſheweth,) with
w Receipt, and coat-
, as before is ſhew-
: And this being
ced artificially up-
the ſhort barrels or
es (as the Figure
. ſheweth) and
lined with fine
wder directly a-
inſt the Touch holes
the barrels, paſſing
little paper over the
me, firing the ſaid trains at both the ends, which a they
rn, ſhall ſtill diſcharge the ſhort pieces one after ano.her,
the great hurt of the Adverſary.

How to burn Wooden Bridges, Gates, Houſes, &c.

TO perform this and the like military Services, if you can come to anoint the ſame with ſome ſuch liquid compoſition as is before ſhewed for the coating of Fire-works, melting in the ſame a good quantity of bruiſed brimſtone, and ſticking in the ſame arrows of Wild-fire, made



in proportion, as the Figure K doth ſhew. The Rec may be made as the former for Pikes, with Wild-fire, w will certainly ſet the ſame on fire, for the Receipt is ſo cible that it will burn in the water.

Devices for cutting of Shrouds of Ships.

ALſo to cut the Tackle of Ships, or to do many o good ſervices, either with muſket or great Ordna it is good to chain two bullets together, as the Figure ſheweth.

Another.

ALſo for the like purpoſe aforeſaid, if you take a ſmall Iron Chain with good Links, rolling the ſame together ind, that it may go eaſily into the Piece, cloſe down to wad, the ſame being again diſcharged, will ſpread it ſelf length, and do good execution.

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w to do excellent Service againſt an enemy who would enter a Breach, a Gate, a Bridge, a Ship, &c.

that the Enemy will enter (and that you intend not to yield) it is neceſſary to have in readineſs divers hollow llets made of two plates of iron, or other metal, ſo that one may cloſe about the other round like a box, which ng filled with pebble ſtones, ſquare pieces of iron, called e-ſhot, musket bullets, or the like, which being diſ-rged out of a murdering Piece, it will do great execu-n: if you will fill caſes of wood, made like unto a Lan-rn with the ſame ſtuff, it will perform the like ſervice, ing ſhot out of a Murdering piece: Behold both the fi-es marked with the letter A.

How to prevent a train of Powder laid to blow you up before you enter a Ship, or other place.

IF you imagine that there is ſome train laid to blow you up (as it often happeneth) you may prevent the ſame, by waſhing certain Purſes of Canvas, filled half full of good corn-powder, and with eight or ten fiery bullets an inch, or an inch and half in height; and filling the other part of the Purſe with ſlow Receipt, you may when you think good (the Receipt being well fired) throw the ſame from you, which will burſt in pieces at the lighting on the ground, and diſperſe the ſaid cloſed bullets here and there, which bullets will burn furiouſly, and if there be any train of powder laid near it will preſently fire the ſame. The ſaid purſes are very good to throw out of hand, or may be ſhot out of a Mortar piece amongſt men in battle-array, to diſorder them, or into a Towne; the Figure B ſheweth how to fill the purſe, and the Letter C. ſheweth the proportion of it, being made up, filled and coated over.

The Receipt for making theſe bullets of Wild-fire is following: Take of Sulphur in meal ſix parts, of Roſin in meal three parts, melting the ſame in ſome pot or pan over a ſlow fire; then take of Stone-pitch one part, of hard Wax one pound, of Tar one fourth part, of Aqua vitæ one half-part, of Linſeed-oyl as much, of Verdegreaſe one fourth part, and of Camphire one eighth part, melting all theſe together likewiſe, and ſtir into the ſame two parts of Peter in meal; and taking the ſame from the fire put therein four parts of bruiſed powder, working the ſame well together in your hands, and roul the ſame round of the bigneſs that you would have your balls, boring two holes through the ſame a croſs, which when you would uſe, muſt be primed full of bruiſed Powder: theſe balls will be as hard as ſtone, and need no coating, and being fired will burn furiouſly, and cleave to any

ning, not diminishing in quantity being burned to ashes, which ashes will kindle an Oaken board: If you please, you may shoot these bullets out of a Piece of great Ordnance. The Figures for the Purses here follow.

B

C

Short, but certain Rules for the maki all ſorts of fire-works for recreation, as Rockets, Fiſgi Runners on the Line, Serpents, Stars, Fire-whee Clubs, Jack in a Box, *&c.* Together with the quanti of all the Ingredients thereunto belonging, and t manner of compounding them.

How to compoſe a Caſtle of Fire-works with ſmall charge, t in the firing will yield as much variety, and give as m content as any: Now publiſhed for the benefit of young Pra oners. By W. R.

IN all things actual, a certain method is requiſite be obſerved. Therefore, ſuch as intend to put Practice theſe enſuing Inſtructions, are firſt to provi themſelves of ſuch Rocket Moulds as are ſuitable the work they undertake. The deſcription and proport of them, I conceive ſomewhat needleſs, in regard any o may in Crooked Lane, *London*, be furniſhed with what zes they pleaſe. This being premiſed, I ſhall begin wi

Fiſgigs, by many called Serpents.

THE beſt way of making them is thus: having provide a ſmall mould without a Needle, make a Coffin paper fit for it, which choak half an inch from the en then put it in your mould; and fill up three inches wi powder-duſt only, finely beaten and ſifted, then choak again, and afterwards fill it about an inch with corn powd then choak it cloſe, and your Fiſgig is prepared. To theſe on the tops of great Rockets, put into the mouths them ſome of the Compoſition for Stars, which will ſtr very delectable to the ſpectators; for after they ha continued a good ſpace in the form and manner of Stars they will then riggle to and fro, like ſo many flying Serpents Of theſe Fiſgigs moſt ſorts of Fire-works are compoſed

When

When you can perfectly make these, you may then proceed to the making

Runners on a line.

AND for them is likewise requisite a Mould, five inches long without a Needle: first make your Coffin of paper, choak it at the end as before, then put it in your mould, and fill it four inches with Powder-dust: (Note that in the filling it, you must put in but a little at a time, and ramm it down close, and so of all others.) Then choak it, and fill the rest of it with corn powder (to give a report) leaving only so much of the Coffin void as will serve to choak it. This being done tye it to a hollow Cane three inches long; so as in tying of it you do not bruise the Rocket. And so have you a single Runner for the Line finished.

If you desire to have a double one to run forwards, and back again, you must then be provided of two Runners made after the manner of the former, only one to be an inch longer than the other: And to finish these, use this method. First tye the long Rocket to the Cane, and at the mouth of it fasten the breech of the short one, by rouling over them a little piece of Paper, with some powder dust in it to give fire to the long one, not forgetting to make a small hole in the breech of the short one with a bodkin, that so the long one may take fire; having done so, then turn back the short Rocket so, that the mouth of it may reach somewhat further than the breech of the long one; lest in fixing it you accidentally fire both, and by that means spoil your Runners; The best way of tyeing the double ones is to fasten the short one so, as the long one may be betwixt it and the Cane; for by that means it will run without swagging; whereas if they be both joyned to the Cane, as Mr. *Bates* and some others direct, it is both unsafe, and uncertain; unsafe in this, in case the first accidentally break, the other with the force of it will be struck off; and uncertain it is likewise, in regard after the first Rocket is spent the Coffin of it coming back will swag and retard the passage of

the

the other, and by that means indanger burning of the Line. Let your Line be well rubbed with ſoap: which will both ſecure it from fire and facilitate the paſſage of the runner: likewiſe for theſe and all other, let your Powder-duſt be beaten, and ſifted very ſmall, for the leaſt corn in it may danger the breaking.

How to compoſe a Wheel.

FIrſt provide a Wheel, either round or ſquare, the beſt ſort are 8 ſquare, made fit to the length of the Rocket five inches each, the beſt proportion is about ſixteen inches diameter. Now having provided a Wheel, take ſo many Rockets, made after the ſame manner as thoſe are which run on the line, which you muſt faſten together, by joyning the mouth of the one to the breech of the other, in the ſame manner as thoſe for the line; in the tying them on, have a care you do not bruiſe them, and be ſure to leave ſome ſpace betwixt the mouth of the firſt, and the breech of the laſt, that ſo by firing the firſt, the laſt may not take, and by that means breed a confuſion.

You may order theſe Wheels to burn either Horizontal or Vertical: for the Horizontal provide a poſt or ſtaff with a pin on the top of it to put the wheel on; if vertical then provide a pin faſtned to the ſide.

How to make a Club to caſt forth divers Fiſgigs.

TO do this, firſt cauſe a piece of wood to be turned ſix inches diameter, let it be bored with an Augur of an inch and half bore from the top towards the bottom, leaving the bottom ſomewhat above an inch thick, and place underneath to faſten a ſtaff in; the length of it may be about eighteen inches: then draw a line ſpiral-ways about it from the bottom to the top in manner of a ſcrew, each line an inch and half a ſunder; in that line bore ſmall holes an inch aſunder within half an inch of the bottom, and then pierce it through with a Piercer; let your holes be of that bigneſs fit to contain a Fiſgig, and make them ſome

what slopeways, that so the Fisgigs may stand fast, though thick, otherwise they will not come easily forth.

Load your Club or Trunk with the composition following, and then put in your Fisgig made as before, priming each of them, and likewise each hole with powder-dust, then fire your Club at the top, and they will fire one after another, and fly about in a confused manner.

The Composition for this Club is

Roch Peter eight ounces, Sulphur vivum four ounces, powder dust two ounces, Camphire one ounce, Linseed oyl half an ounce, beat and mix these according to the order prescribed in the compositions following.

To make Rockets for the Air.

PRovide first a good mould of what size you please, with a Needle in it, and a Rowler with two Rammers, the one hollow for the Needle and the other sad; to ram it after the Needle is covered. Having made a good strong Coffin of paper fit for the mould, and choaked as before, then fill it with the composition for that size your Rocket is of, the several proportions and mixtures hereafter follow. To fill it, take a little tin scoope, and put in about the twentieth part of the quantity it holds, and then ram it with your hollow rammer, and so continue till you have filled it to the top of the Needle, always beating it down with two or three good strokes of a mallet, then fill in more almost to the top of the Mould, ramming it as before, but with your sad rammer, leaving only so much unfilled as that you may double down some of the paper, and ram it close, making a little hole with a bodkin to give fire to some corn powder (to give a report) put within that Paper as is left unfolded down, and then choak it, next prime it, as shall be shewn hereafter, and then proceed to heading of it, which you may do several ways, either with Srars, Serpents, Crackers, or golden Rain: the composition for the making these hereafter follows. To place these on the Rocket, first make a thin Coffin of paper, the inside of it somewhat wider than the outside of the Rocket, which

which you may fit by rouling it on the outside of the mould, and fitting it to the Rocket, then fasten it to the top of the Rocket, and strew a little powder in it, having first made a small hole in the top of the Rocket, to give fire to it: in this Coffin you may place short Serpents with the mouths downward made as before, or with Stars only, Crackers or golden Rain; having done this, take a piece of thin pasteboard, and with a pair of Compasses make a round circle in it, then divide it in two, and with the one half make a cap taper-wise, fit to cover the head, and with glew fasten it to it: then provide a dry Osier stick about eight times the length of the Rocket, straight and flatted at the end, to this fasten the Rocket, tyed at both ends just in the choaking place, that so you may not loosen the composition within, then poise the stick, by ballancing it on your finger three or four inches from the mouth of the Rocket.

The Ingredients for Rockets for the Air of all sizes.

FOr Rockets which contain from one ounce to four, to one pound of powder-dust, put two ounces of Charcole dust: for Rockets which hold from five ounces to ten, to one pound of powder, put two ounces and a half of charcoal dust: and for Rockets which hold from ten to sixteen ounces, to one pound of powder put three ounces of charcoal dust; but be sure that both your powder-dust in this and all other be well beaten, and finely sifted, as likewise your coal dust. If by trying your composition you find it too strong, you may mend it by adding a small quantity of coal-dust to it: if too weak, then by adding a little powder-dust. My advice is, to mix a pretty quantity together, that so by the tryal of one Rocket you may be ascertained of the rest: for all powder is not of one and the same strength.

Priming for Rockets.

TAke Cotten wick (such as the Chandlers use) and soak it in oyl of Camphire, then take it out and roul it in powder dust, then dry it, and keep it close, otherwise the

the ſtrength of the camphire will decay. The compoſition for Stars will likewiſe fire them.

Compoſition for Stars, and firſt for thoſe of a blew and red colour.

POwder mealed fine four ounces, Salt-peter two ounces, Sulphur vivum ſix ounces, beat theſe very fine, and then mix them, adding thereto one ounce of Aqua vitæ, and a quarter of an ounce of oyl of Spike. To make theſe up for uſe, Take a rouler about the bigneſs of an arrow, and roul paper on it, and paſte it cloſe, then fill it with the compoſition before preſcribed, and beat it hard, then cut it into ſhort pieces half an inch in length, dipping one end in glew, and ſtrewing the other with powder duſt, it is then finiſhed, only let it be dry before you uſe it.

A Compoſition of Stars of a very beautiful colour, the eaſieſt, beſt and ſureſt way, never till now made publick by any.

SAlt-peter one ounce, Sulphur vivum one ounce, powder-duſt one ounce, Camphire a quarter of an ounce, beat theſe very fine and mix them, after wards make paſte of them with the oyl of Turpentine, and then make up little pieces about the bigneſs of a Peaſe, which roul in powder-duſt and let it dry. Of this ſort you may put two or three dozen at the head of an ordinary Rocket, the charge and trouble of making is far leſs than any other way.

To make golden Rain.

PRovide your ſelf of a good quantity of Gooſe Quils cut them off at the end next the feathers, then fill the quills with the following compoſition, and they will make a very glorious ſhew. To one quarter of a pound of powder-duſt, add half an ounce of coal duſt, and for uſe put the open end of the quill downwards.

To make a Jack in a Box.

PRovide a tin box six inches deep, with a socke made under the bottom of it to place it on a staff, let it be of what bigness you please, in the bottom of it strew some corn powder almost half an inch thick, then fill it with Serpents, or Fisgigs placed with the mouths downward, leaving a place in the midst for a cane to pass through, which fill with a slow composition; (that for Stars, or the following are very good) then put in the cane, and fasten a cover of pasteboard very close over the box, that so it may not fire before its appointed time.

A composition that burns with a flame slow and sure.

ROch peter four ounces, Sulphur vivum two ounces, Camphire one quarter of an ounce, powder-dust one ounce. Meal these very fine and mix them, adding thereto one quarter of an ounce of Linseed oyl, and a quarter of an ounce of oyl of peter dropped in by degrees, and so wrought to a paste. To meal your Camphire, dip the pestle in oyl of Almonds.

Another sort of mixture that burns sparkling.

POwder-dust four ounces, Coal-dust two ounces; this rammed close in a Cane, renders the sight very delectable to the Spectators.

A composition for a white fire, that lasteth long.

SAlt-peter eight ounces, Powder-dust two ounces, Sulphur vivum four ounces, Oyl of Peter one ounce, Camphire half an ounce; meal those which are to be mealed, and incorporate them together.

How to compose a Caſtle of Fire-works with ſmall charges, that in the firing ſhall yield as much variety, and give as much content as any.

First provide an indifferent large frame of wood, four ſquare, with little round Towers of Paſt-board at the corners, the beſt ſize is 18 inches ſquare, and twelve inches high, let the bottom be made firm to ſtand on any place, and the ſides with gates, (as your fancy ſhall direct) then faſten on the inſide three ledges of wood on each ſide about, each ledge with a groof made on the top of it, then make ſo many holes in the frame of wood, ſuitable to the ledges, as you intend to have the Caſtle give reports: you may eaſily make eight to each ledge, which contains 24 reports, you may add more as you ſee cauſe; or at the top faſten many Crackers, which at the end will fire like a volley of ſhot: the manner of making theſe reports ſhall be ſhewed hereafter; and to place them, firſt prime your groof with a ſlow compoſition, and from the uppermoſt Row to the ſecond put a wick, primed, as for Rockets, and ſo from the ſecond Row to the third, leaving one hanging forth at the door to fire it, then put in your reports the mouths inward, fix them to your groofs and cover it cloſe, afterward fit a board four ſquare to cover the top of the Caſtle, of each ſide half an inch broader than the Caſtle, on the four edges of it you may faſten a board cut ſtone-work wayes in manner of a battlement, and at each corner, place a ſmall jack in a box with a long Cane in each of them, filled with ſlow compoſition, made as before; which Canes let be of the largeneſs as may burn all the time the Caſtle is firing: in the midſt of the board on the top, place a pin to put a wheel on, made of thin Deal board, five ſix or eight inches ſquare, proportionable to the length of the Rockets, which faſten to the board by making holes in it, to tye them to it: on the top of this Wheel you may faſten little ſtatues of Babies, as Souldiers, Drummers,

mers, or the like: and as the Wheel turns, they will m
about like Anticks, with much delight to the ſpectato
And ſo have you finiſhed your Caſtle. To fire it, firſt
the four Canes in the four Boxes at the corners, then
the Wheel at the top, and laſtly, fire the cotten wick
the Gate, and ſo the reports will by degrees fire upwa
and in the end conclude with a volley of ſhot. If it be ex
ly made, it will continue a long ſpace with abundance
delight.

How to make reports for a Caſtle.

FIrſt make a Coffin of paper choaked as before, of w
ſize you pleaſe, then fill it about an inch and a half w
corn powder, ramming it cloſe; and at the end ram i
piece of paper as you do to a muſket, leaving the mo
open, and then it is finiſhed: When you uſe them, pr
the mouth of it but a little.

How to make Rockets for the Ground.

FIrſt, provide a Rocket (ready finiſhed) as for the f
then put the breech of it into a bladder, blow the bl
der up, and then faſten it at the choaking place, by ty
it cloſe: when you fire it, throw it from you, and the fo
of it when it comes to the ground will make it rebou
and ſo be in a continual agitation.

Experimen

Experiments perform'd by Legerdemain.

How to make it freeze by the fire side.

THis feat cannot be performed at every time, but only in winter, and at such times as snow may be had, and he that will shew it, must have in readiness an handful of salt. The time serving, the party provided, let him call for a joynt-stool, a quart pot, and a handful of snow, a little water, and a small staff or stick; first, let him pour a little water upon the stool, and upon it let him set the quart pot, and put the snow into the pot, the salt also, but privately, then let him hold the pot fast with his left hand, and take the short stick in his right, and therewith churn the snow and salt in the pot, as if one should churn for butter, and in half a quarter of an hour the pot will freeze so hard to the stool, that you can scarcely with both hands pull it off from the stool: there is a natural reason may be given for this, which any that is a Scholar need not to be told, and for a common Reader I would not have so wise as to know, therefore I omit

How to make two Bells come into one hand, having put into each hand one.

This feat must be performed with three Bells, you must put one Bell into your left sleeve, then put one bell

into one hand, another bell into the other hand (this must be little Morris Bells) withdraw your hands, and privily convey the bell in your left hand into your right hand: Then ſtretch both your hands abread, and bid two folks hold your hands faſt, but firſt ſhake your hands and ſay, do you hear them. The Bell that is in your left will not be known by the ratling, but that it is in your hand: Then ſay, he now that is the arranteſt Whore maſter or Cuckold of you both ſhall have both the bells and the other ſhall have none at all: open your hands then and ſhew them, and it will be thought that you deal by Magick.

How to make a Jugling Book, or Book of Waggery.

YOu muſt provide a Paper-book in Octavo, of what thickneſs you pleaſe; firſt turn over ſeven leaves of it, then upon both the open ſides, draw or paint the picture of flowers, then turn over ſeven leaves more and do the very ſame; do this untill you have turned the book once quite over; Then unto the farther painted leaf paſte a little ſtay of paper or parchment one directly over another. Then turn over the book again, and having turn'd every ſixth leaf, draw the picture of flower de-luces, and then paſte ſtayes of parchment upon them as you did upon the firſt; but theſe ſtayes muſt all of them be a little lower than the former. Then turn over the book again, and after the fifth leaf throughout the book is turned, paint horns: do thus until you have painted the book full of pictures, only let there be one part of the leaves fair paper; having thus finiſhed the book, when you uſe it, hold it in your left hand, and with your right hand your thumb ſet upon the parchment ſtayes, ſhew them orderly and nimbly, but with a bold and audacious countenance, for that muſt be the grace of all your tricks, ſay, This book is not printed thus as ſome of you may ſuppoſe, but it is of ſuch a property that whoſoever blowes on it, it will give the repreſentation of whatſoever he is naturally addicted unto, and then turn the book, and ſay, ſee it is all fair paper.

Boxes to change Grain.

MAke one Box of Wood, Tinne, or Braſs: let the bottom fall a quarter of an inch into the box, and glew thereon a laying of barley, or ſuch like grain: draw the box with the bottom downwards, and ſay, Gentlemen, I met a Countrey-man going to buy barley, and I told him I would ſell him a penny worth, alſo I would multiply one grain into ſo many buſhels as he ſhould need, then caſt a barly-corn into your box, and cover it with a hat, and in the covering it, turn the bottom upſide down: then cauſe ſome body to blow on the hat, then uncover it, and they will think ſtrangely of it. You may make another box of wood like unto a bell, to hold ſo much juſt as your former box will, and make a bottom unto this box of ſhooe-ſole leather, to thruſt into the bottom of the bell: then fill it with barley, and thruſt up the leather bottom, for it will keep the barley from falling out, take this box out of your pocket, and ſet it down openly upon the table, and ſay, I will not cauſe all the barley to go out of my meaſure into my bell, then with the hat cover the box that hath the barley glewed into it, and in covering it, turn it with the barly downward, then ſay, firſt, let us ſee whether there be nothing under the bell, and clap it hard down upon the table, ſo the weight of the barley will thruſt the bottom down; then bid ſome one blow hard on the hat, then take it up, where they will ſee nothing but an empty meaſure, then take up the bell, and all the barley will pour out. Sweep it then preſently into your hat or lap, leſt their buſie prying may chance to diſcover your leather bottom.

A Conceit to procure laughter.

TAke a ball in one hand, and another in the other, and ſtretch your hands as far as you can one from the other, and if any will, lay a quart of wine with him that you will not withdraw your hands, and yet will make both

of them come into either hand which they pleaſe: It is no more to do, than to lay one down upon the table, and turn your ſelf round, and take it up with the other hand, and your wager is won, and it will move no ſmall laughter to ſee a fool ſo loſe his money.

How to knit an hard knot upon an handkercher, and ſeem to undo the ſame with words.

MAke one plain looſe knot, with the two corner ends of a handkercher, with ſeeming to draw the ſame very hard, hold faſt the body of the ſaid handkercher (near to the knot) with your right hand pulling the contrary end with the left hand, which is the corner of that which you hold. Then cloſe up handſomely the knot which will be yet ſomewhat looſe, and pull the handkercher ſo with your right hand, as the left hand end may be near to the knot: then will it ſeem to be a true and firm knot: and to make it appear more aſſuredly to be ſo indeed, let a ſtranger pull at the end which you hold in your left hand, while you hold faſt the other in your right hand; and then holding the knot with your fore-finger and thumb, and the nether part of your handkercher with your other fingers, as you hold a bridle, when you would with one hand lift up the knot, and lengthen your reins. This done, turn your handkercher over the knot with the left hand, in doing whereof, you muſt ſuddenly ſlip out the end or corner, putting up the knot of your handkercher with your fore-finger and thumb, as you would put up the aforeſaid knot over your bridle. Then deliver the ſame (covered and wrapt within the midſt of your handkercher) to one to hold faſt, and after the pronunciation of ſome words of art and wagers laid, take the handkercher and ſhake it, and it will be looſe.

How to transform any one small thing into another form by folding of paper.

TAke a sheet of paper and fold or double the same, so as one side be a little longer than the other: then put a Counter between the two leaves of the paper up to the middle of the top of the fold, holding the same so as it be not perceived, and lay a Groat on the outside there right against the Counter, and fold it down to the end of the longer side: and when you unfold it again, the Groat will be where the Counter was, and the Counter where the Groat was, so as some will suppose that you have changed the money into a Counter, and with this many feats may be done.

How to convey Money out of one of your hands into the other by Legerdemain.

FIrst you must hold open your right hand, and lay therein a teaster, or some big piece of money, then lay thereupon the top of your long left finger, and use some words of Art, and upon the sudden, slip your right hand from your finger, wherewith you held down the teaster, and bending your hand a very little, you shall retain the teaster still therein, and suddenly drawing your right hand thorow your left, you shall seem to have left the teaster there, especially when you shut in due time your left hand. Which that it may more plainly appear to be truely done, you may take a knife, and seem to knock against, so as it shall make a great sound: but instead of knocking the piece in the left hand (where none is) you will hold the point of the knife fast with the left hand, and knock against the teaster held in the other hand, and it will be thought to hit against the money in your left hand. Then after some words of Art pronounced, open your hand, and, when nothing is seen, it will be wondered at, how the teaster came removed.

How to make a Six-pence seem to fall through a Table.

YOu must have an handkercher about you, having a Counter neatly sewed in one of the corners of it; take it out of your pocket, and desire some body to lend you a tester, and seem to wrap it up in the midst of the handkercher, but retain it in your hand, and instead of so doing wrap the corner in the midst that hath the Counter sewed in it and then bid them feel if it be not there, which they will imagine to be no other than the tester that they lent you, then bid them lay it under a hat upon the table, and call for a basin of water, hold it under the table and knock, saying *vade*, come quick, and then let the six-penee fall out of your hand into the water. Then take up the hat, and take the handkercher and shake it, saying, that is gone, then shew them the money in the basin of water.

How to seem to blow a six-pence out of another mans hand.

TAke a six-pence, blow on it, and clap it presently into one of your spectators hands, bidding them to hold it fast: Then ask of him if he be sure to have it, then to be certain, he will open his hand and look. Then say to him, Nay but if you let my breath go off, I cannot do it, Then take it out of his hand again, and blow on it, and staring him in the face, clap a piece of horn in his hand, and retain the six pence, shutting his hand your self. Bid him hold his hand down, and slip the easter between one of his cuffs. Then take the stone that you shew feats with, and hold it unto his hand, saying, *By vertue hereof, I will and command the Money to vanish, you hold in your hand: Vade* now see: when they have looked, then they will think that it is changed by the vertue of your stone. Then take the horn again and seem to cast it from you retaining it, and say, *Vade*, and anon say you have your money again: He then will begin to marvel, and say, I have not: say then to him again, you have, and I am sure you have it; Is't not in your hand? If it be not there; turn down one

one of your ſleeves, for it is in one I am ſure, where he findeth it, he will not a little wonder.

How to caſt a peice of Money away, and to find it in another mans mouth, pocket, or purſe.

THe Jugler calls for ſome one piece of Coin, as a teaſter or a ſhilling of any one in the company, he willeth him to mark it with what mark he will, then he taketh it, and caſteth it away, and cometh to his confederate (who is furniſhed beforehand with the like piece of Coin, marked with the very ſame mark) and bids him deliver the money out of his pocket, purſe, or if he ſay the word mouth; for this is concluded of before-hand. Now this confederate, to make the matter ſeem more ſtrange, will fume and fret, asking how he ſhould come by it, till having found the mark, he will confeſs it to be none of his, wondring at his skill, how he ſhould ſend it thither: and all the reſt be taken with a real admiration of his extraordinary cunning.

How by the ſound of a Counter phillipped to tell what ſide is uppermoſt, whether croſſe or pile.

THe Jugler draws a Counter out of his pocket, and ſaith to the company, See here is a Counter, take it who pleaſe, and let him phillip it up, and I will by my cunning tell you whether croſs or pile be uppermoſt by the very ſound, for you ſhall hoodwink me. Now there are three, or four, or more confederates in the place, who ſeeming ſtrangers as well as the reſt, will be very importunate to have the phillipping it, and before one of theſe ſhall have it, who by ſome ſign of the fingers or countenance (foreknown to the Juggler) do give him information after he is demanded. Of the ſame nature is that trick formerly mentioned in the book, and called, The decollation of *John Baptiſt.*

To make one dance naked is a trick of the ſame nature, for the party afore-hand is agreed to do it, and alſo the

manner and circumſtances: So that the Jugler to blind the people, pronounceth ſundry words to ſuch a perſon, he then begins to rave like a mad man, and puts his cloaths off with a kind of violent carelesness, though God knows, the party knows as well what he doth, as your ſelf that reads it.

After the ſame manner ſhall you know what money another hath in his purſe, and caſting money into a pond, and finding it under a ſtone or threſhold in another place.

Alſo to make a piece of money to leap out of a cup and run to another, by means of a ſmall hair faſtned to the money, which hair the Confederate guideth: with a multitude of ſuch like ſtrange feats, which may ſeem impoſſible to the judgement of the common people to be effected without the aſſiſtance of the Devil, or ſome familiar, which to nominate is neither needful, nor will my occaſions permit ſo much leiſure as to do it.

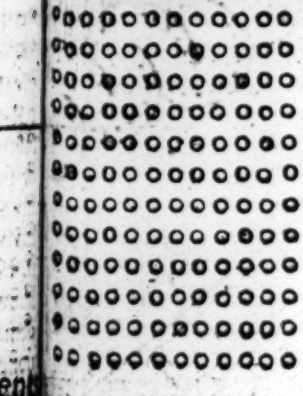
Experiments

Experiments in Arithmetick.

I.

A number of men being delivered to an Officer to make thereof a Square Battail, and suddenly to tell how many ranks he shall have, and how many men in each rank.

Suppose the number of men delivered to be 144. therefore extract the square Root of 144, which is 12, and so many men shall you have in flank, and as many in file.



Note that if the number had not been a square number, there would have been some odd men remaining.

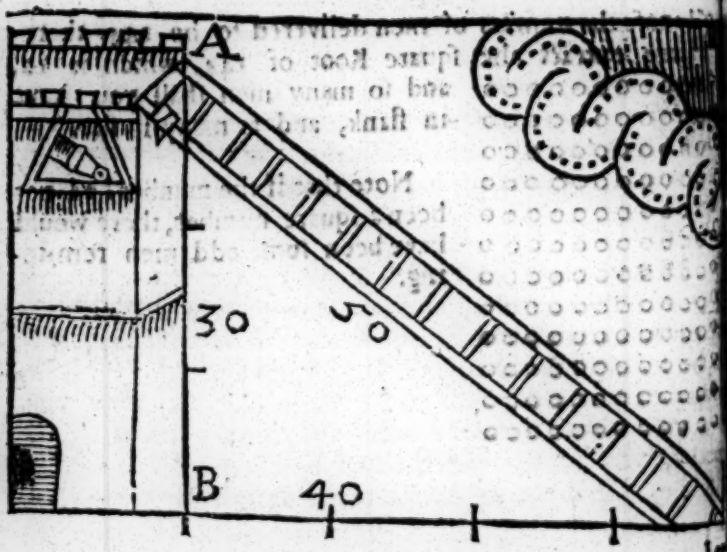
II.

The wall of a Fort or Caſtle being thirty foot high, and the breadth of the Trench about the wall forty foot broad, I demand the length of a ſcaling-Ladder that will reach from the edge of the Trench to the top of the wall.

THis experiment is grounded upon the 47 Propoſition of the firſt of *Euclid*, who ſaith, In all right-angled-triangles, the ſquare of that ſide which lieth againſt the right angle, is equal to the two ſquares of both the other ſides.

From whence we may gather, that if the heighth of the Wall be ſquared, and the breadth of the Trench likewiſe ſquared, and thoſe two ſquared numbers added together, and from them extract the ſquare Root, that Root ſo extracted ſhall be the length of the Scaling-ladder required.

As for Example, in the Figure following.



Let A B. represent the Fort, being 30 foot high, and C the breadth of the Trench, 40 foot, then ſquare 30, *fit* 900, likewiſe ſquare 40, *fecit* 1600: which added make 2500, the Root of which number is 50, the length of the Hypothenuſal or Scaling ladder required.

III.

Admit the Semidiameter of the earth to be 3346 *miles, and that there is a Mountain one mile in height; I demand how far ſuch a Mountain may be ſeen at Sea or on Land.*

ADd the Semidiameter of the earth and the Mountain together, *fecit* 3437, whoſe ſquare is 11812969. From which ſubſtract the ſquare of the ſemidiameter of the earth, viz. 11806096, there remains 6873, whoſe Root is 82 and three fourths; wherefore you may conclude, that the Mountain may be ſeen almoſt 83 miles.

IV.

The General delivered to his Maſter Gunner 3 *Pieces of Ordnance; together with* 168 *pound of powder, the biggeſt of which Pieces ſpent at a ſhot* 6 *pound, the ſecond* 4 *pound, and the third* 2 *pound, who commanded him to employ them againſt the battery of a Sconce, demanding of the Gunner how many ſhots each piece would make, being diſcharged one as often as another, and alſo how much powder each Piece would ſpend.*

LEt the quantity of each Piece be ſet down into order, one under another, and added into one entire ſum, as 6.4.2. *fecit* 12, behind which towards the right hand ſet down the ſumme of the Powder delivered, *viz.* 168, which if you divide by 12, the quotient will be 14, which certainly telleth that they will make 14 ſhots a piece againſt the Sconce.

lib.	
6	*lib.*
4	*168 ſh.*
2	*xxx* 14
12	*x*

Now

lib.
84
56
28

168

Now to know how much powder each Piece will spend: multiply 14 by 6, *fecit* 84, for so much will the first Piece spend; again multiply 14 by 4 *fecit* 56, so much will the second spend; and lastly multiply 14 by 2, *fecit.* 28 so much will the last Piece spend: which being added into one entire summe the total will be 168 pound, which is equal to the powder by the General at first delivered.

A General having drawn the platform of a Fort, demanded of 50 Pioneers what time they required to finish it in? who replyed 6 weeks, or 36 dayes (which is all one) but the condition was such that it must be finished in 8 dayes; now we know what number there must be imployed.

THE resolution of this question to some may seem difficult, but to others very plain and easie, for if you multiply 50 (which is the number of Pioneers) by 36 (the number of dayes which they require) and divide the product by 8 (which is the time that the Fort must be finished in) the quotient of that division will be 225, and so many must be imployed to finish it in eight days.

Pleaſant Queſtions IN ARITHMETICK.

Queſtion I.

To tell the number that another man ſhall think, be it never ſo great.

LEt the party that thinketh, double the number which he thought; which done, bid him multiply the ſum of them both by 5, and give you the product (which they will never refuſe to do, it being far above the number thought) from the which if you blot the laſt figure of the product (which will always be a Cipher or 5) the number thought will remain.

Example.

Let the number thought be 53, which doubled maketh 106, and multiplyed by 5 makes, 530, then if you take away the Cipher which is in the laſt place, there will remain 53. the number thought.

Queſt.

110

Quest. II.

Of the accusation of a Thief.

A Thief breaking into an Orchard, stole from thence a certain number of Pears, and at his coming forth met with 3 men one after another who threatned to accuse him of theft; and for to appease them, he gave unto the first man half the Pears that he stole, who returned him back 12 of them. Then he gave unto the second half of them he had remaining, who returned him back 7. And unto the third man he gave half the residue, who returned him back 4; and in the end he had still remaining 20 Pears. Now do I demand how many Pears he stole in all? To answer this question you must work backward; for if you take 4 from 20, there will remain 16, which being doubled make 32, from which abate 7, and there will remain 25, which being doubled makes 50, from which substract 12, and there will remain 38, which again doubled make 76, the true number of Pears that he gathered.

Quest. III.

Of three Sisters.

A Certain man having three Daughters, to the Eldest he gave 22 Apples: to the second he gave 16 Apples: and to the third he gave 10 Apples: and sent them to the Market to sell them, and gave them command to sell one as many for a penny as the other (namely 7 a penny) and every one to bring him home so much mony as the other, and neither change either apples or moneys one with another; How could that be?

This to some may seem impossible: but to the Arithmeticians very easie. For whereas the eldest had 3 penniworths and one apple over, the second two penniworths and two apples over, and the youngest had one penniworth and three apples over: So that the youngest had so many single apples, and one peniworth, as the eldest had penny-worths

worths and one apple over, and consequently the second proportional to them both.

They made their Markets thus: A Steward coming to buy fruit for his Lady, bought all the apples they had at 7 a penny, leaving the odd ones behind, then had the eldest Sister three pence and one apple, the middle Sister two pence and two apples, and the youngest one penny and three apples. The Steward bringing the fruit to his Lady, she liked it so well, that she sent him for the rest; who replyed that there were but few remaining he notwithstanding sent him for them, and bid him bring them at any rate. The Steward coming to the Market again, could not buy the odd apples under a penny apiece (who to content his Lady was fain to give it) then had the youngest Sister three peniworths, the middle Sister two peniworths, and the eldest one peniworth, and so had they all four pence a piece, and yet sold as many for a penny one as another, and neither changed apples nor moneys one with another, as they were commanded.

Quest. IV.

Of one that bought and sold both at a rate, and yet in the end proved a Loser.

A Man bought 100 Egges at three a penny, having 120 to the hundred, also he bought a hundred more at two a penny, having likewise 120 to his hundred, these Egges being mingled, he sold them away for 5 two pence, and 20 to the hundred as he bought them, the question is whether he gained or lost in that bargain.

If you work by the Rule of Three Direct, you shall find that his 120 Eggs at 3 for a penny came to three shillings four pence, and his 120 at 2 for a penny came to 5 shillings, which being added make 8 shillings, 4 pence. Then again to see what they come to at 5 for 2 pence; work likewise by the rule of Three Direct, and you shall find that 240 at 5 for 2 pence, come but to 8 shillings, whereby the seller loseth 4 pence of the money they cost him.

Experiments

Experiments in Geometry.

I.

How to take the Altitude of a Building, or other approachable height, by a line and plummet, the Sun shining.

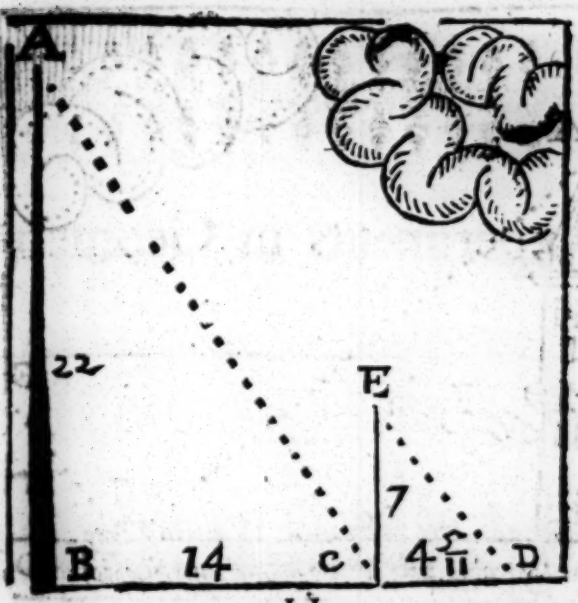
LEt the Building whose Altitude you desire to know be A B representing a May-pole casting his shadow in a right line on the ground to C, at C let fall a line and plummet (whose length before you know in feet or inches) observing where the end of that shadow lights; which suppose at D, then measure the length of the shadow of the string, and consequently the shadow of the building, both which being exactly taken, work thus by the Rule of Proportion?

If C D, the shadow of the line and plummet 4 foot, and 5 give E C 7 foot in altitude;

What altitude doth 14 feet give, which is the length of the shadow of the May-pole?

Multiply and divide according to that Rule, and you shall find in your quotient 22 foot, which is the true altitude of the building required.

How



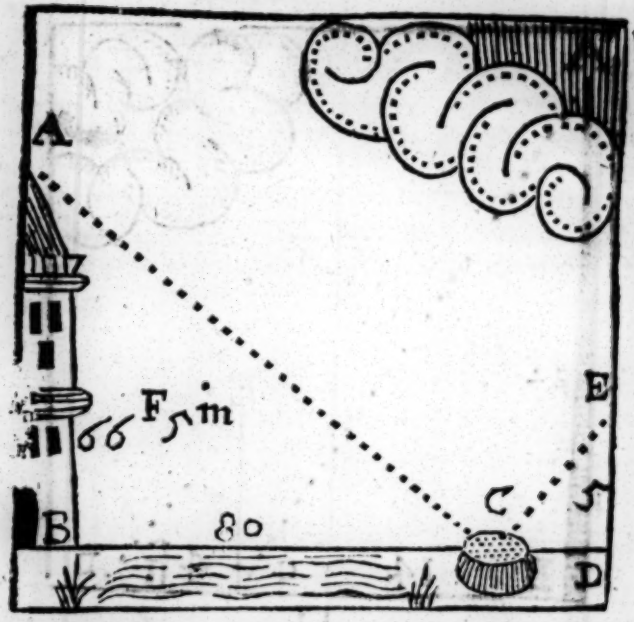
II.

How to take the Altitude by a Bowl of water.

PLace on the ground a Bowl of water, which done, erect your body ſtraight up, and go back (in a right line) from the building, till you eſpy in the Center or middle of the water the top of the Altitude; which done, obſerve the place of your ſtanding, and meaſure the height of your eye from the ground, together with the diſtance from your ſtanding to the water, and the diſtance of the water to the Baſe or foot of the Altitude; which being all exactly taken, will help you to the Altitude required, by the rule of proportion.

Example

Let the Altitude required be A B, the Bowl of water placed on the ground at C, then go backwards from C your body erected as ſtraight as may be to tie your eye at E, ſpy the top of the Altitude A B in the water, which found, obſerve the place of your ſtanding at D, and meaſure



ſure the altitude of your eye to the ground, which is 5 foot, and likewiſe the diſtance from D to C, which is ſix foot, then meaſure the diſtance from C to B, which is 80 foot, theſe 3 diſtances work by the rule of proportion. Thus *As the diſtance C D is to the Altitude E D, So is the diſtance C B to the Altitude A B: which is 6 foot and 8 inches.*

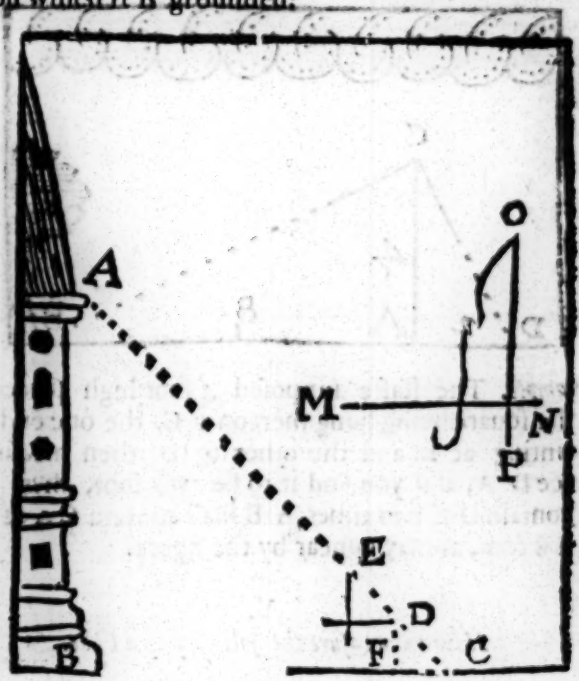
III.

How to find the Altitude of a building by two ſticks of an length joyn'd in a right angle, without Arithmetick.

CAuſe two ſticks to be joyned in a right angle, as is in the figure M N, and O P, having at O a hole made wherein to hang a thread and plummet.

The two ſticks being thus prepared, come to the building whoſe altitude you require (which building let be A B,) then applying the end A of your croſs ſtaffe to your eye, hold it up or down till the thread and plummet hang juſt upon the line C D, then go back or forward (as occaſion

ction is given) till your eye at D looking over E espy the top of the building at A; which found, mark well the place of your standing, which is at F, and measure the distance from your eye to the ground, which is D F, and set that same distance off from F to C, then measure the distance from C to B, for that is the true height of the building A B, as may appear by the figure, and likewise by the Theorem on which it is grounded.



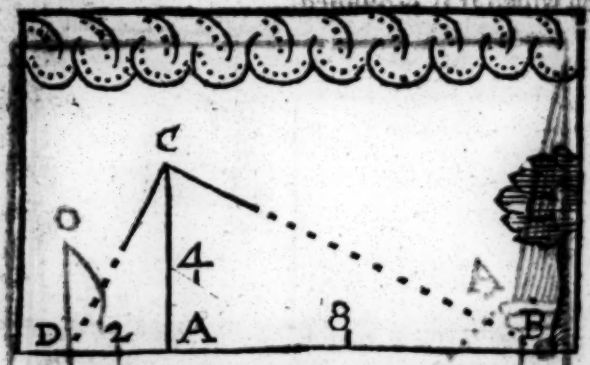
IV.

How to find a distance by the two Sticks joyned square.

THis Experiment is grounded upon the 4 *Prop.* of the 6 of *Euclid.*

Let the distance which you desire to know, be A E. set up a staffe at A. of 4 foot long, (or more or less at your pleasure,) at A C. at the end of the staffe C. place a thread C D. then hanging the angle of the square O. on the top of the

the ſtaffe at C. lift it up or down, till you ſee the farthest part of your Longitude, the ſquare ſo remaining, and the ſtaffe not removed, draw the ſtring that is faſtned at C. cloſe by the ſide of the ſquare, till it touch the ground and then meaſure how many times the diſtance D A. is contained in the ſtaffe, for ſo many times is the ſtaffe contained in the Longitude.



Example. The ſtaffe ſuppoſed 4 foot high placed at A. and the ſquare being hung thereon at C. the one end thereof pointing at B. and the other to D. then meaſure the diſtance D A, and you find it to be two foot, then ſay, if C A contain D A two times, A B ſhall contain C A as many, that is 8 foot, as may appear by the figure.

V.

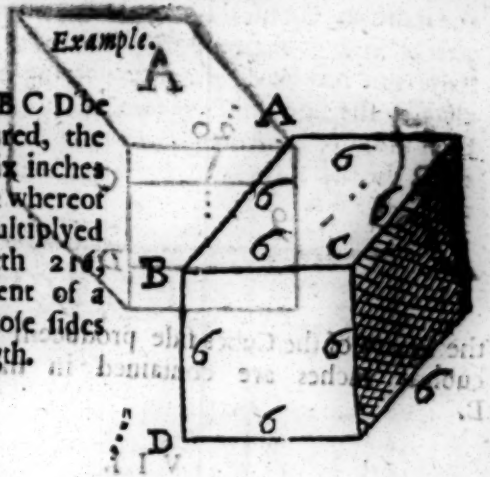
How to meaſure the ſolidity of a Cube.

THe Cube is a body compoſed of 6 ſquare ſuperficies of equal proportion, and is meaſured in manner following.

If you multiply any one ſide in it ſelf cubically, it produceth the ſaid Cube.

Example

Example.



Let the Cube A B C D be given to be measured, the sides whereof are six inches in length, the square whereof is 36, which again multiplyed by the root produceth 216, which is the content of a Cube in inches whose sides are six inches in length.

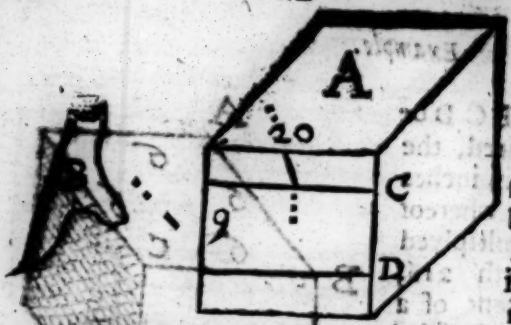
V. I.

How to measure the solid content of any body how irregular soever it be, the form or fashion not regarded.

TO perform this you must prepare an hollow Cube, into which put your irregular body, which being placed therein, you shall pour in so much water till it no more than cover the body in the Cube, then make a mark in the inside of the Cube where the superficies of the water toucheth. This done, take out the irregular body, and mark again directly under the former, where the brim of the water now toucheth, for the distance of these 2 marks multiplyed by the square of the Cubes side produceth the crassitude of that irregular body.

Example.

Suppose A. to be the cubical hollow vessel, whose inward side suppose to be twenty inches: B the irregular body whose crassitude I desire. First, therefore I put *B.* into the hollow Cube A. and pouring in water till it be throughly covered, admit the brim of the water reach unto C, then



taking out that irregular body again, admit the superficies of the water fall to D. then measure the distance between C. and D. which suppose is 9 inches, which multiplyed in 40. the square of the Cubes side produceth 3600. and so many cubical inches are contained in the irregular body B.

VII.

How the Weight of any part or portion of a solid body may be known, without separation thereof from the other part of the body.

HAving a Cube prepared as before declared, first, put the solid body thereinto, which done fill the Cube top full of water, then softly lift that body out of the water, till such time as there remain no more in the water than that proportion whose weight you desire to know, at that instant make a mark on one side of the Vessel where the superficies of the water then toucheth, then take out the body all together, this done, measure the distance from the former mark to the superficies of the water as it is now after the body is taken quite out. Likewise measure the distance of the waters superficies from the top of the Cube, which done, augment the weight of the whole body by the lesser distance, and divide by the greater, your quotient will shew the true weight of the fragment required.

Example

Example.

Admit B C to be in all 100 pound weight being either brass, iron, silver, lead, stone, or other mettal, my desire is to know the weight of the portion C. first therefore putting the whole body into the vessel A. I fill it full of water, then lifting it softly up till all the body be out of the water, excepting C. I find the superficies of the water to be fallen to E. where I make a mark, then take out the whole body, admit the water is fallen to F. and that by measuring I find E F. to be 8 inches, and D F. 20 inches, 8 multiplyed in 100, (the whole pillars weight) yieldeth 800. which divided by 20 (the greater distance) bringeth in the quotient 40, so many pound weight I conclude the portion C. to weigh.

VIII.

How Archimedes *found what quantity of Gold was taken out of the King of the* Syracusans *Crown, and how much silver put in the room thereof, without breaking of the Crown.*

HIero King of the *Syracusans* in *Sicilia* had caused to be made a Crown of gold of a wonderful weight to be offered for his good success in the wars; in making whereof, the Goldsmith fraudulously took out a certain portion of gold, and put in silver for it, so that there was nothing abated of the full weight, although much of the value diminished: Which thing at length being uttered, the King was sorely moved, and being desirous to try

the truth, without breaking of the Crown, proponed the doubt to *Archimedes*, unto whose wit nothing seemed impossible, which although he could not presently answer, yet he had good hopes to devise some policy for that invention, and so musing thereon, as he chanced to enter into a bane full of water to wash him, he observed that as his body entred into the bane, the water did run over: whereby his ready wit of such small effects conjecturing greater works, conceived by and by a reason of solution of the King's question, and therefore rejoycing exceedingly (more than if he had gotten the Crown it self) forgot that he was naked, and so ran home crying as he ran, *inveni, inveni*, I have found, I have found, and thereupon caused two masse pieces, one of gold and another of silver, to be prepared of the same weight that the Crown was of, and considering that gold is heavier of nature than silver, and therefore gold of like weight with silver, must needs occupy less room by reason of its more compact and sound substance, he was assured that putting the mass of gold into a vessel brim full of water, there would not so much water run out, as when he should put in the silver mass of like weight. Wherefore he tryed both, and noted not only the quantities of the water of each time, but also the difference or excess of the one above the other, whereby he learnt what proportion in quantity is between gold and silver of equal weight, and then putting the Crown it self into the water brim full, (as before) marked how much water did run out then, and comparing it with the water that run out when the gold was put in, noted how much it did exceed that, and likewise comparing it with the water that run out when the silver was put in, marked how much it was less than that, and by those proportions found the just quantity of gold that was taken out of the Crown, and how much silver was put in Instead of it; by the which ever since the proportions of metals one to another are tryed and found.

IX.

How a man may descend into the bottom of any Water or River, his body remaining dry.

THis Experiment was shewed at *Toledo*, by two *Greeks*, who taking a Cauldron of great capacity the mouth turned downward, and so hanging it in the air by ropes, they fasten certain shelves in the midst of the Cauldron, where they place themselves and a fire. Then to make it hang at *æqua libra*, they compass the Circumference thereof with leaden plummets on every side equally, and made of equal weight, lest any part of the Circumference of the mouth of the Cauldron when it is equally and softly let down into the water, should sooner touch the water than the whole Circumference, so should the water easily overcome the air inclosed in the Cauldron, and resolve it into moisture. But if by due proportion (the Cauldron thus prepared) be softly set down into the water, the air inclosed in the Cauldron (by resistance of the water) shall violently make himself place, not admitting the water to enter. So the men there inclosed, shall so long remain dry in the midst of the water, untill success of time do by respiration weaken and consume the inclosed air. But if in due time the Cauldron be softly and equally drawn out of the water, the men shall remain dry, and the fire not extinct.

This Experiment may thus be proved.

Take a Cup or Glass of a certain quantity, the Circumference of the mouth whereof shall be broader than the Circumference of the bottom, in the mouth whereof let be fastned a little stick, tying thereto a thread and plummet. On the stick fasten a little Candle of Wax, whose light may come only to the middest of the Cup, lest too much nearness of the water might suffocate the Candle; Then proportionably (as in the former Experiment) put the cup with

with the burning Candle into a Veſſel full of water, and in due time draw it out ſoftly and equally, ſo that no part the mouth or Circumference thereof be drawn out before the whole, ſo ſhall the Candle remain burning as it was when it went in.

X.

To break a Staffe upon two Glaſſes of water.

PLace the Glaſſes being full of water upon two joynt Stools or ſuch like, equidiſtant from the ground, and diſtant one from another, the length of the Staffe; Then place the ends of the Staffe upon the edges of the two Glaſſes, ſo that they be ſharp; this done, with all the force you can, with another Staffe ſtrike the Staffe which lies on the Glaſſes in the midſt, and it will break, without breaking the Glaſſes or ſpilling the water.

XI.

To make a Glaſs of water ſeem to boil.

TAke a Glaſs near full of water, and ſetting one hand upon the foot of it, hold it faſt, turn ſlightly one of your fingers of your other hand upon the brim or edge of the Glaſs, having before privately wet your finger, and ſo paſſing ſoftly on with your finger in preſſing a little, the water will ſeem to boil and leap over the Glaſs by drops.

XII.

How to know the hour of the Day by the hand and finger.

TAke a ſtraw or the like, of the length of the Index, or the ſecond finger, hold this ſtraw very right between the thumb and the right finger, then ſtretch forth the hand, and turn your back and the palm of your hand towards the Sun, ſo that the ſhadow of the muſcle which is under

nder the thumb touch the line of Life, which is between he middle of the two other great lines, which is seen in e palm of the hand; this done, the end of the ſhadow ill ſhew what of the clock it is, for at the end of the great nger it is 7 in the morning, or 5 in the evening, at the end f the ring-finger, it is 8 in the morning, or 4 in the even-ng, at the end of the little finger, or firſt joynt, it is 9 in e morning, or 3 in the afternoon, 10 and 2, at the ſecond oynt, 11 and 1, at the third joynt, and mid-day in the line lowing, which comes from the end of the Index; Note at this Experiment muſt be performed by the left hand.

XIII.

How to make two Images, one of which ſhall light a Candle, and the other blow it out.

UPon the ſide of a wall make the figure of two Images, in the mouth of each put a pipe or quill, ſo artificial-that it be not perceived in one of which place Salt-peter ry fine, and dry and pulveriſed, and at the end ſet a le match of paper, in the other quill Sulphur beaten ull. Then holding a lighted Candle in your hand, ſay one of thoſe Images by way of command, blow out the ndle, then lighting the paper with the Candle, the Salt-et will blow out the Candle immediately, and going to other Image, (before the ſnuff of the Candle be out,) ch the Sulphur with it, and ſay, Light the Candle, and it ll immediately be lighted.

XIV.

How to make a Clock with one wheel.

MAke the body of an ordinary Dial, and divide the hour in the circle into 12 parts, make a great wheel ight above the Axle-tree, to the which you ſhall place Cord of your counterpoiſe, ſo that it may deſcend, that 12 hours of time your Index or Needle make one revo-

lution,

lution, which may be known by a Watch, then put a ba-
lance, which may ſtop the courſe of the Wheel, and give
it a regular motion, and you ſhall ſee an effect as juſt from
this, as from a Clock with many Wheels.

XV.

To find what is hidden in two hands.

SUppoſe that a man holds divers things in his hands, as
Gold and Silver, and in the one hand he holdeth the
Gold, and in the other the Silver, now to know
which hand the Gold is in, and which the Silver; appoint
for the Gold 4 ſhillings, and for the Silver 3 ſhillings, or
any other prices, ſo one be odd, and the other even, then
bid him triple that which is in the right hand, and double
that which is in the left hand, then bid him add theſe two
products together, and ask him if it be even, or odd; if it be
even, then the Gold is in the right hand; if odd, the Gold
is in the left hand.

XVI.

To make a Cone to move by the edge of a Table.

MAke therefore a Cone of paper, and ſet it on the Ta-
ble, cunningly conveying under it a Beetle, or ſome
like creeping thing, and you ſhall ſee the thing to move on
the Table, as if the paper were a living creature.

XVII.

How with three Pots of 8. 5. 3. pints, to part 8 pints of Wine into two equal parts. Pots A. B. C. Pints 8. 5. 3.

EMpty A. into B. B. into C. C. into A. B. into C. (B the meaſure of 5 pints,) there will remain 4
pints. Then Empty C. into D, and C. will have none,
but A. will likewiſe have four pints.

To cause Water (contrary to the Nature thereof) to ascend.

PRepare a Bason with a pint of water in it, or thereabours, then take an earthen Pot or Jugg, with a round belly, (fittest for this service) and light a piece of paper, cast it into the Jugg flaming, then turn quickly the mouth of the Jugg downward, and set it on the midst of the Bason of water; it will suck up all the water, if it be no more than it can receive and contain in the belly of it.

To carry a Jugg or earthen Pot, sticking without any thing, to the palm of your hand.

TAke a piece of paper, set it on fire, and cast it flaming into the mouth of the Jugg, presently clap the palm of your hand on the mouth of the said Jugg or Pot, not hollow, but plain and smooth, the Jugg will not fall from your hand, but you may walk many paces, and carry the same sticking unto the palm of your hand, unless, by Violence, you pluck it away.

To make white Letters appear on a black piece of Paper.

BEat both the yolk and white of an Egg, well together until it be liquid like Writing ink, write your mind therewith on paper, suffering it to dry, then wash over your paper with some black Colour, such as Printers Ink is, and let it by till both be dry, then take your knife and scrape over the superficies of the paper, and the Letters formerly written will come forth, and whites appear in their room.

To write on Parchment, and the Letters not to be seen, &c.

ASsoon as you have written on Parchment, hold it to the Candle or heat of the fire, and it will shrivel together, and run into its self in such wise as not a word scarce can be read; When you would have it Ligible, put it in a wet or moist place, or sprinkle it gently with water, and it will extend in length again.

To get out and deface the Writings, or blots upon Parchment.

TAke a Pencil and wash the place, of the Parchment with *Aqua-fortis*, and the Ink will come out.

To

To make an Old Writing appear Fair.

TAke Galls and boyl them in Wine, and wash the Writ therewith.

To take the impression of the Seal of a Letter.

MElt a little brimstone, casting in some white Le put this mixture on the Seal-strengthning it with small piece of paper, a little bigger then the impression being cold take it of, and you shall find the print of the Se thereon.

How to write a Letter secretly that cannot easily be discover or suspected.

1. VVRite your mind at large on one side of the p per with common Ink, and on the other s with Milk, that which you would have secret; and wh you would make the same legible, hold that side which written with Ink to the fire, and the milky Letters will she blewish on the other side.

2. Rule two papers of one bigness, with lines of an equ distance, make the one full of glass Windows, through whi you must write your mind upon the second Paper, then fi up the spaces with some other words at your pleasure but if all were made to hang together in good sence, it woul carry the less suspicion, each Friend must have one of th cut papers to read all such Letters, for without the pape it will trouble a good Decipherer to read the Letter.

Many Cards placed in divers ranks, to find which of these Ca any one hath thought.

TAke 15 Cards and place them in 3 heaps, rank wise, 5 in heap, now suppose any one had thought one of these Ca in any one of these heaps, it is easy to find which of the Ca it is, and it is done thus, ask him in which of the heaps i which pl e in the midle of the other two, then throw do the Cards by 1 and 1 into 3 several heaps, in rank wise til all be c down, then ask him in which of the ranks Card is, which heap place in the Middle of the other tw

eaps always, and this do 4 times at least, so in putting the ards altogether, look upon the Card, or let their back be wards you, and throw out the 8 Card; for that was the rd thought upon without fail.

Of the Ass, and Mule.

T happened that the *Mule* and the *Ass*, upon a day, ma- king a Voyage, each of them carryed a Barrel full of ine; now the lazy *Ass* feeling her self over-laden, com- ined and bowed under her burden, which the *Mule* see- g, said unto her, being angry (for it was in the time that uls spake) thou great *Ass* wherefore complainest thou, I had but only one measure of that which thou carryest, ould be loaden twice as much as thou art; and if I should e a measure of my Loading to thee, yet my burthen uld be as much as thine. Now how many measures each of them carry? Answer, The *Mule* did carry en measures, and the *Ass* five measures, for if the *Mule* one measure of the *Asses* loading; then the *Mule* would e 8 measures, which is double to 4, and giving one to the each of them would have equal burthens, to wit, 6 sures a piece.

To know if there be any water in Wine or not.

Ake raw pears, pare them and make them clean and cut them in the middle: or else take Mulberries, and cast m into the Wine, and if they swim upon the Wine, it is e and clean without water, but if they sink to the Botto.n, e is water mixt with wine.

To make round Balls to take out spots of Oyl or Grease.

Ake purging Sope or soft Sope, and incorporate it with the ashes of Vines finely sifted, as much of the one as the er, then put among the said Powder, Roch Allum bur- , and the dry Lees of Wine called Tartar, well beaten powder; incorporate all well together, and make there- ittle round apples or Balls, and then it is fit for use.

To

To make a Water that taketh of the Colouring of the hands of any Artificer, as Dyers, &c.

TAke the Juice of a Lemmon, with a little bay Salt, and wash your hands with it, and let them dry of themselves, wash them again, and you shall find all the Spots and Scurf gone: it is also very good against the Scurf or Scabs.

To make Glew or past that holdeth as fast as a Nail.

TAke Pix *Græca*, and rosin, and the powder of burnt Brick, which is called Ceruse, and mingle all together and heat it, when you will use it, and when it is cold, it will hold fast as a Nail.

To make a bait to catch wild Geese, and Ducks and all other sort of Fowl.

TAke the Seed of Belenge, and the Roots also, and steep them in Water, the space of a day and a night with the Seeds, then seeth the said thing with the water they were steeped in, so that the Seeds may well drink and soke of the said Water then lay the said Seed or Grain in the place where they are wont to frequent, and they will eat the Grain or Seed thus prepared, and thereupon sleep as if they were drunk; so that you may take them with your hands this may also seem to take all manner of Fowl, being cast in the place they usually frequent: If you would bring them to their senses again, give them to drink Oyl Olive and they will revive again.

To prevent fleas from Dogges.

TAke the Green outward shell of Walnuts and stamp them, and anoint the Dogg with it, where the fleas vex him, and especially in the Ears, and the fleas shall not touch him.

To heal Cleft, or Kibed heels.

TAke Dragant, and Galbanum, as much of one as the other, and make thereof a powder, then take new Wax, Oyl of Violets, and a little Goat suet or Ox Tallow, and melt on the fire, then put in the said Powders, and make of all these an Oyntment, wherewith anoint your heels, and they will be suddenly whole.

FINIS.

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